

## *Eupithecia* Curtis, 1825 of Afghanistan (Geometridae: Larentiinae)

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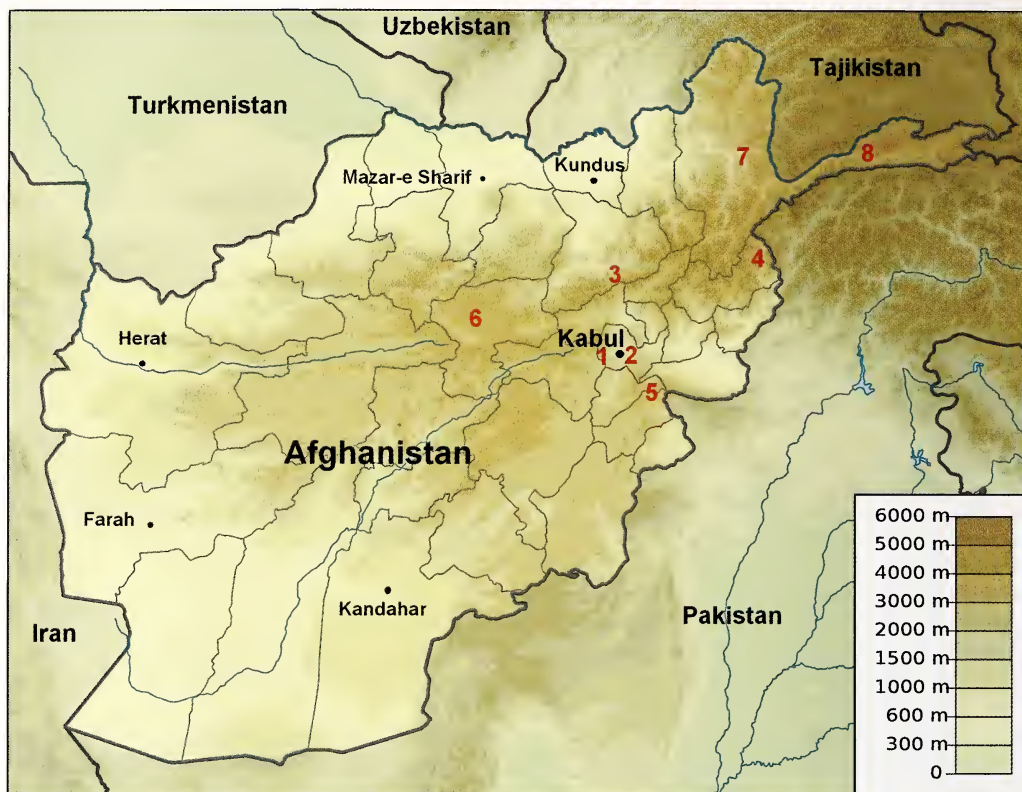
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**Abstract.** In this paper 49 species of the genus *Eupithecia* Curtis, 1825 (Lepidoptera, Geometridae) are recorded for the fauna of Afghanistan. The type specimens of the majority of these species were studied. In case of *Eupithecia ochrovittata* Christoph, 1887 it was necessary to designate a lectotype. The following three new species are described: *Eupithecia tabestana* sp. n., *Eupithecia fredii* sp. n. and *Eupithecia naumanni* sp. n. Five taxa are synonymised: *Eupithecia linariatoides* Mironov, 1989 **syn. n.** is a synonym of *Eupithecia mirificata* Brandt, 1938; *Eupithecia denotata* f. *difficilis* Dietze, 1911 **syn. n.**, synonym of *Eupithecia nigrilinea* (Warren, 1896); *Eupithecia eberti* Vojnits, 1978 **syn. n.**, synonym of *Eupithecia obtinens* Brandt, 1941; *Eupithecia subomnigera* Vojnits, 1988 **syn. n.**, synonym of *Eupithecia tshimganica* Viidalepp, 1988; *Eupithecia procera* Vojnits, 1982 **syn. n.**, synonym of *Eupithecia exactata* Staudinger, 1882. A total of 42 species are recorded as new for the fauna of Afghanistan.

**Zusammenfassung.** In dieser Arbeit werden insgesamt 49 Arten der Gattung *Eupithecia* Curtis, 1825 (Lepidoptera, Geometridae) für die Fauna von Afghanistan belegt. Für die überwiegende Zahl der Arten konnten die Typen untersucht werden. Für *Eupithecia ochrovittata* Christoph, 1887 wurde ein Lectotypus designiert. Drei Arten werden neu beschrieben: *Eupithecia tabestana* sp. n., *Eupithecia fredii* sp. n. und *Eupithecia naumanni* sp. n. Fünf Taxa werden synonymisiert: *Eupithecia linariatoides* Mironov, 1989 **syn. n.** ist ein Synonym von *Eupithecia mirificata* Brandt, 1938; *Eupithecia denotata* f. *difficilis* Dietze, 1911 **syn. n.**, Synonym von *Eupithecia nigrilinea* (Warren, 1896); *Eupithecia eberti* Vojnits, 1978 **syn. n.**, Synonym von *Eupithecia obtinens* Brandt, 1941; *Eupithecia subomnigera* Vojnits, 1988 **syn. n.**, Synonym von *Eupithecia tshimganica* Viidalepp, 1988; *Eupithecia procera* Vojnits, 1982 **syn. n.**, Synonym von *Eupithecia exactata* Staudinger, 1882. Insgesamt werden 42 Arten als neu für die Fauna von Afghanistan dokumentiert.

### Introduction

The genus *Eupithecia* includes nearly 1400 known species distributed worldwide. It is one of the most species-rich genera of the family Geometridae but has hardly been studied in Afghanistan until now. Only two representatives of the genus have been described from this large Asian country by Vojnits (1988): *E. convallata terricolor* Vojnits, 1988 and *E. xanthomixta* Vojnits, 1988, and two species, *E. egregiata* Mironov & Ratzel, 2008 and *E. nigrilinea* Warren, 1896, have recently been mentioned for Afghanistan (Mironov et al. 2008c). However, *Eupithecia* of the adjacent territories has been investigated fairly well, e.g., Turkmenistan, Uzbekistan, and Tajikistan (Staudinger 1892; Dietze 1904, 1908; Viidalepp 1988, 1996; Mironov 1990, 1991), Iran (Bytinski-Salz & Brandt 1937; Brandt 1938, 1941; Schwingenschuss 1939; Vojnits 1978, 1982a, 1982b, 1988), northern Pakistan and Kashmir (Mironov et al. 2008a, 2008b, 2008c). For this



**Fig. 1.** Map of Afghanistan with the main localities of the material from the SMNK (for details see text): 1. E Afghanistan (Paghman); 2. E Afghanistan (Kabulschlucht, Khurd Kabul, Sarobi, Pol-i-Charchi); 3. E Afghanistan (Salang-Pass, Salang); 4. E Afghanistan, (Kunar, Nuristan, Barg e Matal, Kamu); 5. SE Afghanistan (Paktia, Safed Koh, Kotkai); 6. Z-Afghanistan, Koh-i-Baba (Band-i-Amir, Panjao); 7. NE Afghanistan, Prov. Badakshan (Baharak, Pejui, Sarekanda); 8. NE Afghanistan, Wakhan-Valley (Langar, Zemestani Baharak, Kotal-e-Dalez, Darrah-e-Shaur, Sargaz, Sarhad); Source of map: Urutsek – Wikipedia.

area about 170 species of *Eupithecia* have been recorded. In Europe, for comparison, there are 128 species (Mironov 2003).

The first time a few specimens from Afghanistan were collected in 1941 and 1942 by Fred Brandt, whose material is now deposited in the collection of his brother Wilhelm Brandt in NHRS (Stockholm). The greater part of Afghanistan *Eupithecia* was collected later by †H. G. Amsel (SMNK), G. Ebert, M. Müller (SMNK), †C. Naumann (ZFMK), †F. Kasy (NHMW) and †A. & E. Vartian (Vienna) from 1956 to 1972. The majority of this material has remained undetermined.

The main component of the material we used for this paper comes from the large collection of Irano-Afghanian Lepidoptera of the Museum of Natural History Karlsruhe (SMNK). Unfortunately, it is still unclear where the material collected by H. G. Amsel during the “Deutsche Afghanistan Expedition” in 1956 is deposited. After this manuscript was already in review, in March 2012 we found undetermined material of *Eupithecia* from Afghanistan in the large collection of the ZSM, collected by G. Ebert in 1961 and K. Omoto in 1963. From this material we included the important species;

however, 50 of about 130 of these specimens belong to the *innotata*-species group, and because of their worn condition we decided to exclude them from this study.

Nearly all localities of collected *Eupithecia* in Afghanistan mentioned in this work are illustrated on a map (Fig. 1). This map only provides an overview and not the exact positions of the localities.

## Methods

This paper is essentially a faunistic list and constitutes a revision of the species of *Eupithecia* found in Afghanistan. We have been able to locate and examine almost all of the original type material used by K. Dietze, O. Staudinger, O. Bohatsch (MNHU, Berlin), G. F. Hampson, W. Warren, E. P. Wiltshire, H. Inoue (BMNH, London), S. Al-phéraky, H. Christoph (ZISP, Saint Petersburg), W. Petersen (IAET, Tartu; MNHU, Berlin), W. Brandt (NHRS, Stockholm), E. Schütze (ZSM, Munich; SMNS, Stuttgart), R. Pinker (NHMW, Vienna), A. M. Vojnits (HNHM, Budapest; MNHU, Berlin; ZFMK, Bonn; SMNK, Karlsruhe; ZISP, Saint Petersburg) and J. Viidalepp (IAET, Tartu; ZISP, Saint Petersburg). Likewise, we examined the types of 73 species-level taxa from the 87 (84%) that are mentioned in this paper. Most of the types that we did not examine are early-described species with lost (syn)types such as, for example, *E. venosata* (Fabricius, 1787), *E. simpliciatata* (Haworth, 1809), *E. subnotata* (Hübner, 1813), *E. centaureata* (Denis & Schiffermüller, 1775).

Space prevents the inclusion of genitalia figures for all species treated, but we have aimed in this paper to illustrate not only the new species described, but also other species which have not been figured in recent publications. The sequence of species in this work follows the groups into which the genus *Eupithecia* is divided by different authors (e.g., Mironov 2003).

## Abbreviations

BMNH	The Natural History Museum, London, United Kingdom
IAET	Institute of Agriculture and Environment, Estonian Agricultural University, Tartu, Estonia
IZCAS	Institute of Zoology, Chinese Academy of Sciences, Beijing, China
MNHU	Museum für Naturkunde, Berlin, Germany
NHMW	Naturhistorisches Museum Wien, Austria
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
SMNK	Staatliches Museum für Naturkunde Karlsruhe, Germany
HNHM	Hungarian Natural History Museum, Budapest, Hungary
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany
ZISP	Zoological Institute, Russian Academy of Sciences, Saint-Petersburg, Russia
ZMMU	Zoological Museum, Moscow State University, Russia
ZSM	Zoologische Staatssammlung München, Germany



## Systematics

### *Eupithecia olgae* Mironov, 1986

*Eupithecia olgae* Mironov, 1986: Trudy Vsesojuznogo Entomologicheskogo Obshchestva **67**: 96, figs 2a, b. Holotype ♀ (ZISP), Kyrgyzstan: Inner Tian-Shan, Naryn, 2030 m.

**Material.** Holotype ♀, **Kyrgyzstan**, Inner Tien-Shan Mts., Naryn, at light, 2030 m, 25.vii.1983, leg. V. Mironov (ZISP). – Paratypes: 2♀, **Kyrgyzstan**, environs of Przhivalsk, at light, 1600–1650 m, 6., 22.vi.1982, leg. N. Tristan. 1♀, **Kazakhstan**, Aksu-Dzhabagly Nature Reserve, Dzhabagly village, 1300 m, 25.vii.1975, leg. E. Ishkov (ZISP). **NE Afghanistan**: 1♂, Wakhan-Tal, 3400 m, Kotal-e-Dalez, W-Seite, 28.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 271 (SMNK).

Afghanistan is a new country for the distribution area of this Central Asian species. It has been known from Uzbekistan, Kyrgyzstan, Tajikistan, Pakistan, and India (Jammu & Kashmir), southeastern regions of Kazakhstan, China (Tibet, Qinghai, Gansu, Shanxi), and Mongolia. This species is mentioned here as first because it belongs to the *haworthiata* species-group with plate-like, membranous uncus in the male genitalia.

### *Eupithecia dalhousiensis* Mironov & Galsworthy, 2008

*Eupithecia dalhousiensis* Mironov & Galsworthy, 2008: Transactions of the Lepidopterological Society of Japan **59** (1): 65, figs 7, 21, 22. Holotype ♀ (BMNH), [India]: Dalhousie.

**Material.** Holotype ♀, **India**, Dalhousie N.W. Amalnym, Moore Coll. 94–106, *Phibalapteryx inter-rubrescens* ab. *dalhousiensis* Strand, type ♀, BM Geom. slide no. 2944 (BMNH, originally syntype of *E. interrubrescens*). – Paratypes: 1♀, **India**, Simla, 7,000 ft., A. E. Jones BM 1931–101; 1♂, Goorais Valley, June 1887 J. H. Leech, BM Geom. slide no. 2940; 1♂, Murree, 19.v.1976; 1♀, Snogran, 14.v.1970, M. Anwar, BM Geom. slide no. 7705; 1♀, Murree, 17.v.1976; 1♂, Snogran, 15.v.1970, M. Anwar; 1♂, Dungagali, 18.v.1970, BM Geom. slide no. 7704 (BMNH). **SE Afghanistan**: 2♀, Safed Koh, S-Seite, Kotkai, 2350 m, 24–25.vii.1967, M. Müller leg., Ratzel slide no. GU211011/1w (SMNK).

A very large species (wingspan 24–37 mm) from the *Eupithecia abietaria* group (Inoue 1979), which is similar to two other allied Asian species: *E. gigantea* Staudinger, 1897 and *E. interrubrescens* (Hampson, 1902). This species was described and has hitherto been known from Western Himalayas (northern Pakistan and northern India). It was not previously recorded from Afghanistan.

**Remarks.** *E. dalhousiensis* was described in 1919 by Strand as “ab.” (aberration) of *interrubrescens* Hampson. Later it was recognized as a separate species (Mironov et al. 2008a).

### *Eupithecia mirificata* Brandt, 1938

*Eupithecia mirificata* Brandt, 1938: Entomologische Rundschau **55** (50): 587, pl. 3, figs 291–293. Holotype ♀ (NHRS), [Iran]: Comèe.

*Eupithecia liniariatoides* Mironov, 1989 **syn. n.**: Vestnik Zoologii **1989** (3): 13, figs 2a–d. Holotype ♂ (ZISP), Tajikistan: Khorog, Botanical Garden, 2340 m.

**Material.** Holotype ♀, **Iran**, Fars, Strasse Ardekan-Talochosroe, Comèe, ca 2600 m, 22.vii.1937, coll. Brandt, 78/57, coll. RMS, Holotype *Eupithecia mirificata* Brdt. Brandt, 10, photo 18 F 80 det. A. Vojnits (NHRS). – Paratype: 1♂, same locality, 16.viii.1937, coll. Brandt, coll. RMS, Allotype *Eupithecia mirificata* Brdt. Brandt, photo 19 F 80 det. A. Vojnits (NHRS). – Holotype of *E. liniariatoides* ♂, **Tajikistan**, Pamir, Horog, Hortus Botan., 2340 m, 17.vi.1963, M.L. Zaprjagaew, ex coll. Zool. Inst. Acad. Sci. St. Petersburg, Russia (ZISP). – Paratypes of *E. liniariatoides*: 2♂, 2♀, same locality, 2340 m, 20, 21.vii.1960, 4.vi.1961, M. Zaprjagaew; 3♂, 2♀, same locality, 2300 m, 19.vii, 2, 4.viii.1966, 1.vi.1970, 8.vii.1971,

M. Zaprjagaew; 1♀, Pamir mer. occ., fl. Gunt, 2700 m, 29.vii.1962, Bundel (ZISP). **Afghanistan**: 1♂, Pandshir Tal, Unteres Parian, 2500 m, 30.vii.1961, leg. G. Ebert (ZSM); 6 exx., Paghman, 30 km NW v. Kabul, 2100–2500 m, 20–22.v.1963, Kasy & Vartian; 1 ex., Prov. Kadaghan, Salang Paß, Nordseite, 69°L 35°40'B, 11–12.vii.1971, leg. Vartian (HNHM); NE Afghanistan, 2♂, Prov. Badakhshan, 1750 m, 12 km NE of Baharak, Pejuj, 27.vi.1971, UV-Li, leg. Ebert & Naumann, coll. Nr. 224; 1♂, Prov. Badakhshan, 3000 m, 15 km NE of Baharak, Kotal-e-Zardeu, 30.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 230 (SMNK).

In our opinion *E. mirificata*, described from Iran and *E. linariatoides* from Tajikistan are conspecific. The male and female genitalia were illustrated in Mironov (1989b) as *E. linariatoides*.

**Remarks.** Neither the holotype nor paratype (allotype) of this species (*E. mirificata*) have an abdomen or labels with information about genitalia slides. However, there is a series of this species from Afghanistan in current material. *Eupithecia mirificata* appears to be closely related to *E. linariata*, and therefore further investigation of the biology of the early stages and DNA barcoding should be done in the future to clarify the status of this species.

### *Eupithecia minusculata* Alphéraky, 1883

*Eup[ithecia] minusculata* Alphéraky, 1883: Horae Societatis entomologicae Rossicae (1882) 17 (3/4): 225, pl. 9, fig. 91. Holotype ♀ (ZISP), [China]: Kouldja.

*Eupithecia penultima* Wiltshire, 1985: The Entomologist's Gazette 36 (4): 265, pl. 9, figs 2, 3, 5: a–c, 6. Holotype ♂ (BMNH), Iraq: Baghdad, on a Tigris island (synonymised in Scoble et al. 1999).

**Material.** Holotype ♀, **China**, Guldscha, 1.v.1879, Alph., *minusculata*, Origin. (ZISP). – Holotype of *E. penultima* ♂, **Iraq**, Baghdad, at light on a Tigris island, amongst tamarisks, 10.v.1937 (E.P.W.), BM Geom. slide no. 2386 (BMNH). – Paratypes of *E. penultima*: 2♀, same data, BM Geom. slide no. 2416; 1♀, same data but 3.vi.1937; 1♀, Baghdad, west bank of Tigris, 14.v.1954 (E.P.W.), BM Geom. slide no. 2417 (BMNH). **E Afghanistan**: 1♂, 1♀, Nurisan-Bashgal, vic. Barg-e-Matal, 2200 m, 3., 5.vii.1970, Nr. 11, leg. C. Naumann, E-lep 209, Ratzel slides nos GU24408/1w, GU24408/2m (SMNK).

A widespread desert or xerophilous species, ranging from Spain in the west through North Africa (Algeria, Tunisia, Libya) and Mid-East eastward to Mongolia; north to the lower part of the River Volga. It is distributed in Central Asia in Turkmenistan, Uzbekistan, Tajikistan, Afghanistan, southern Kazakhstan, and northwestern China (Xinjiang). Not previously recorded from Afghanistan. The male and female genitalia were described and illustrated by Wiltshire (1985) for the first time as *E. penultima*.

### *Eupithecia venosata* (Fabricius, 1787)

*Phalaena venosata* Fabricius, 1787: Mantissa Insectorum 2: 209. Syntype(s) lost, Austria.

*Eupithecia comparanda* Vojnits, 1981: Annales Historico-Naturales Musei Nationalis Hungarici 73: 221, figs 1, 2. Holotype ♂ (SMNK), Pakistan (west): Swat, Kalam Gabral-Tal, 2100 m (synonymised in Mironov et al. 2008b).

**Material.** Holotype of *E. comparanda* ♂, **W Pakistan**, Swat, Nv. Kalam, Gabral-Tal, 2100 m, 9.vii.1969, leg. G. Ebert, Vojnits slide no. 12093♂ (SMNK). – Paratypes of *E. comparanda*: 3♂, 3♀, **W Pakistan**, Swat, Kalam, 2000 m, 9.vii.1969, leg. G. Ebert, Vojnits slides nos 12094♂, 12095♂, 12096♂, 12099♀, 12100♀, 12102♀ (SMNK); 1♂, 1♀, same data, Vojnits slides nos 12097♂, 12098♀ (HNHM). **W Afghanistan**: 3♂, 1♀, Nurisan-Bashgal, vic. Barg-e-Matal, 2200 m, 3 and 5.vii.1970, Nr. 11, leg. C. Naumann E-lep 209, prep. U. Ratzel 2008, Ratzel slides nos GU3408/1m, GU3408/3w; 1♂, **E Afghanistan**, Nuristan-Bashgal, vic. Barg-e-Matal, 3 km W (Seidental), 2500 m, 6.vii.1970, leg. C. Naumann, Nr. 1106, Ratzel slide no. GU3408/2m (SMNK).

A western Palaearctic species ranging from Portugal and Morocco in the west to the Baikal Lake in Siberia in the east. A new species for the fauna of Afghanistan. The details of the male and female genitalia were described and illustrated in Petersen (1910) for the first time and after that in many other publications of European authors, as well as in Vojnits (1981) for the *E. comparanda* from Pakistan.

### *Eupithecia hilariata* Dietze, 1908

*Eupithecia hilariata* Dietze, 1908: Deutsche entomologische Zeitschrift, Iris **21** (3): 180. Syntypes 2♂, 1♀ [nec 1♂, 2♀] (coll. K. Dietze and R. Püngeler in MNHU), [Tajikistan]: [Ispajran]; [China]: [Juldus-Gebirge], [Ili Gebiet].

**Material.** Syntypes: 1♂, **Tajikistan**, Ispajran, Alai sept., 3400 m, August, 124., *hilariata* Dietze, Ispajran Alai sept., Orig., ♂, Typus, Vojnits slide no. 1178♂. 1♂, **China**, *hilariata*, Juldus, Ili, Zool. Mus. Berlin, *hilariata* Dtze., präp. Nr. A 835♂, det. E. Schütze, Kassel; 1♀, *hilariata*, Palpen lang, Juldus., Ili, Zool. Mus. Berlin, *Eupithecia hilariata* ♀, Juldus Ili, prep. № 1657.2 E. De Laever det. 1957 (coll. K. Dietze in MNHU). 1♂, Asia centr., **Kyrgyzstan**, Togus-torau, Rückbeil 1901, ? *Schiefereri* var. ♂ (*hilariata*), v. R. Tancre, 2.02, *hilariata*, Sehr nahe *schiefereri*; palpen spitzer u. länger (Dtze.), *Eupithecia hilariata* ♂, Type, Prep. № 1657.1 E. De Laever det. 1957 (coll. R. Püngeler in MNHU). **Afghanistan**: 1♂, Pagman-Gebirge (Kabul), ca. 3000 m, Juni–Juli 1942, coll. Brandt, 8, Paratypus *Eupithecia frediana* Schüt. (undescribed) ♂, E. Schütze, Kassel, photo 16 F 80 det. A. Vojnits (NHRS); 1♀, Paghman, 30 km NW v. Kabul, 20–22.vii.1963, 2200 m, Kasy & Vartian, Ratzel slide no. GU12609/1w; 2♂, 1♀, same locality, but 2500 m, 3., 5., 12., 15.vi.1965, Kasy & Vartian, Ratzel slides nos GU2609/3m, GU31209/1m, GU12609/2w (NHMW).

A new species for the fauna of Afghanistan. Its range is in Turkmenistan (Kugitang Mts.), Uzbekistan (Karzhan Tau Mts., Chimgan Mt.), Tajikistan (Pamirs Mts.), Kyrgyzstan (Tien-Shan Mts.), mountains of southern and southeastern Kazakhstan, and the northwestern province of China (Xinjiang). The male and female genitalia were described and illustrated by De Laever (1960) and Schütze (1960) for the first time.

### *Eupithecia nigrilinea* (Warren, 1896)

*Tephrochystia nigrilinea* Warren, 1896: Novitates Zoologicae. 3: 317. Holotype ♀ (BMNH), [India]: Kasauli.

*Eupithecia* ?*denotata* f. *difficilis* Dietze, 1911 **syn. n.**: Biologie der Eupitheciiden **1**: pl. 85, figs 905–907; ibidem (1913), **2**: 92. Holotype ♀ (designated by Vojnits; coll. K. Dietze in MNHU), [Tajikistan]: Ispajran [=Isfara], 3400 m.

*Eupithecia ingrata* Vojnits, 1981: Annales Historico-Naturales Musei Nationalis Hungarici **73**: 224, fig. 4. Holotype ♀ (SMNK), Pakistan (west): Swat, N of Kalan Gabral-Tal, 2100 m (synonymised in Mironov et al. 2008c).

*Eupithecia ingrata talvei* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 121, pl. 2, fig. 18; text-pl. 26, figs 5–10. Holotype ♂ (IAET), Tadjh. SSR [Tajikistan]: Gissarsky Mts, southern slope, River Khonaka, Shamol.

**Material.** Holotype ♀, **India**, Kasauli aug. 1893, *nigrilinea* Warr. Type ♀ (BMNH). – Holotype of *E. denotata difficilis* ♀, **Tajikistan**, Ispajran, Alai sept., 3400 m. August, *difficilis* Typ. Alai sept., Holotypus *Eupithecia difficilis* Dietze [design. by Vojnits], Vojnits slide no. 10240 ♀ (coll. K. Dietze in MNHU). – Paratype of *E. denotata difficilis*: 1♂, **Tajikistan**, Ispajran, Alai sept., 3400 m. August, *difficilis* Type., Alai sept. (coll. K. Dietze in MNHU). – Holotype of *E. ingrata*, ♀, **Pakistan**, Swat, N v. Kalam, Gabral-Tal, 2100 m, 6–9.vii.1969, leg. G. Ebert, Vojnits slide no. 12092♀ (SMNK). – Holotype of *E. ingrata talvei*, ♂, **Tajikistan**, Ghissarsky Mts., southern slope, Khonaka r[iver], Shamol, 7.vi.1976, leg. Talve (IAET). – Paratype of *E. ingrata talvei*: 1♂, **Kyrgyzstan**, Mts. Tschatkalensis merid., lacus Sary-Tschilek, 1900 m, 13.vii.1964, Bundel (ZISP). **Afghanistan**: 1♂, Pagman-Gebirge (Kabul), ca. 3000 m, vi–vii 1942, coll. Brandt, R. M. Prep. 4898, 7473 E94+, *Eup. centripunctata* Schü., Präp. Nr. S 1211♂, det. E. Schütze, Kassel, Monotypus *Eup. centripunctata* Schü. (undescribed), E Schütze, Kassel, Naturhistoriska



Riksmuseet, Loan no 366/06 (NHRS); 1♀, NE Afghanistan, Gebirge Badakschan, Sarekanda, 2800 m, 21.vii.1953, J. Klapperich, Ratzel slide no. GU24911/2w (SMNK); 1♂, E Afghanistan, Sarobi, 1100 m, 17.x.1961, leg. G. Ebert, Ratzel slide no. GU13312/3w; 1♂, Hazaradjat, Koh-i-Baba, Pandjao Umgeb., 2500 m, 26.vi–1.vii.1961, leg. G. Ebert, Ratzel slide no. GU13312/4m (ZSM); 15♂, 2♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 14–23.vi.1966, 21.vi–1.vii.1969, G. Ebert leg., Vojnits slides nos 16959♂, 16960♂, 16961♂, 16962♂, 16966♂, 17545♂, 17548♂, 17549♂, 17550♂, 19502♂, 19540♂, 19542♂, 19543♂, 19544♂, 19545♂; 16963♀, 16965♀; 4♂, 3♀, same locality, 20–25.vi, 4.vii, viii, 1967, 5., 28.vi, 2.vii.1968, M. Müller leg., Vojnits slides nos 16955♂, 16979♂, 17564♂, 17566♂, 16975♀, 16976♀, 19546♀; 1♂, Prov. Paktia, same locality, 16–17.vi.1971, UV-Li, Ebert & Naumann; 1♂, 2♀, E Afghanistan, Salang-Pass, N-Seite (Khinjan), 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slides nos 19536♂, 17872♀, 19495♀; 1♂, 4♀, C Afghanistan, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slides nos 17779♂, 17780♀, 19490♀, 19511♀, 19519♀ (SMNK); 1♂, 4♀, C Afghanistan, Koh-i-Baba, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slides nos 19521♂, 19487♀, 19515♀, 19552♀ (SMNK; coll. Ratzel); 2♀, E Afghanistan, Salang-Nord, 2100 m, vic. Khindjan, 13.vi.1970, leg. Naumann, Nr. 1067, Ratzel slides nos GU25408/3w, GU25408/4w; 1♂, 1♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 23., 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 261 and 262; 1♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263 (SMNK); 4♀, same locality, 3400 m, Kotal-e-Dalez, W-Seite, 28.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 271 (SMNK; coll. Ratzel).

This is mainly a mountainous Central Asian species which has been recorded hitherto from Uzbekistan, Tajikistan, Kyrgyzstan, northern Pakistan, Jammu & Kashmir, India (Himachal Pradesh), Nepal, and was also found in the mountains of northern Thailand. It was recorded for the fauna of Afghanistan by Mironov et al. (2008c). *E. nigrilinea* is a univoltine summer species, present in habitats from about 1700 m up to about 4500 m above sea-level. The male genitalia were described and illustrated in Inoue (2000), the female in Vojnits (1981) and Viidalepp (1988) as *E. ingrata*.

### *Eupithecia barteli* Dietze, 1908

*Eupithecia barteli* Dietze, 1908: Deutsche entomologische Zeitschrift, Iris 21 (2): 162, pl. 2, figs 13, 14.

Syntypes 1♂, 2♀ (coll. K. Dietze and R. Püngeler in MNHU), [Kazakhstan]: Uralsk.

*Eupithecia artshae* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 124, pl. 2, fig. 21; text-pl. 28, figs 2, 3, 6–8. Holotype ♂ (ZISP), Tadjh. SSR [Tajikistan]: SW Pamirs, Khorog, botanical garden, 2300 m (treated as subsp. of *Eupithecia barteli* Dietze, 1908 in Mironov 1990).

**Material.** Syntypes: ♀, **Kazakhstan**, Uralsk, 2.viii.1907 Max Bartel, *Barteli*, ♀ Type. Uralsk., Karl Dietze, Kann dies aberrative *subfulvata* sein? Dietze, Zool. Mus. Berlin, Mironov slide no. 480♀ (coll. K. Dietze in MNHU); 1♀, Uralsk, 24.vii.1905, 4/06 von M. Bartel, n. sp. (Dietze), n. sp. (Bohatsch), *Barteli* ♀ Type, K. Dietze (coll. R. Püngeler in MNHU). – Holotype of *E. artshae* ♂, **Tajikistan**, Pamir, Chorog, Nortes Botan., 2300 m, 29.viii.1965, M. Zaprjagaew (ZISP). – Paratypes of *E. artshae*: 2♀, same locality, 4.ix.1966, M. Zaprjagaew, Viidalepp prep. 2684♀, 2685♀ [ZISP microprep. 17087, 17088]; 1♀, Pamir occident., fl. Obi-Chingou, Lulichariv, 10.viii.1959, 1750 m, A. Bundel. 1♀ (*nec* ♂), **Kyrgyzstan**, town Naryn, 23.vii.1982, Mironov V.G. (ZISP). **Afghanistan**: 1♀, centr., Bamian, 31.vii.1963, Kasy & Vartian, Vojnits slide no. 15139♀ (HNHM); 1♂, C Afghanistan, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slide no. 19520♂ (SMNK).

This species is found in Tajikistan, Kyrgyzstan, Jammu & Kashmir, India (Himachal Pradesh), Nepal, and China (Shaanxi, Yunnan) from about 1300 m up to about 3000 m above sea-level, and its range extends to the southeast of European Russia and north-western Kazakhstan in the north. A new species for the fauna of Afghanistan. *E. barteli* is a medium-sized species with distinctive broad and obtuse wings. The presence of a distinct and relatively large, black discal dot and light, ochreous medial area behind this discal dot on the forewing are very good characters to distinguish this species from

any other in this area. The male genitalia are very similar to those of other species of the *tripunctaria* group, but the female genitalia can be easily recognized by the large globular corpus bursae with elongated and narrow, S-shaped ductus bursae with numerous longitudinal striations and a row of short spines (Mironov 2003).

### ***Eupithecia vetula* Mironov & Ratzel, 2008**

*Eupithecia vetula* Mironov & Ratzel, 2008: Transactions of the Lepidopterological Society of Japan **59** (2): 127, figs 4, 21, 28. Holotype ♂ (SMNK), Pakistan: Azad Jammu & Kashmir, Thunian, 2300–2700 m.

**Material.** Holotype ♂, **Pakistan**, Azad Jammu & Kashmir, Thunian, 2300–2700 m, 25–30.viii.2004, leg. V. Gurko, Ratzel slide no GU18505/3m (SMNK). – Paratypes: 8♂, 24♀, same locality, Ratzel slides nos GU18505/1m, GU18505/2w, GU21505/1w, GU21505/2w, GU22505/2w, GU25505/1w, GU25505/3w, GU27505/1m (SMNK, coll. Ratzel, BMNH); 1♀, SW Himalaja, Indus-Kohistan, Kaghantal, Naran, 3200–3400 m, 16.vii–5.viii.1977, leg. De Freina, Ratzel slide GU4507/4w (SMNS); 1♀, Himalaya Mts., Kaghan valley, Tathabaya, 73°26'E, 34°36'N, 2200 m, 1.v.1998, leg. Gy. M. László & G. Ronkay; 2♀, Himalaya Mts., Valley of Indus, between Chilas and Dassu, Motel Barseen, 1100 m, 10.x.1998, leg. Gy. M. László & G. Ronkay (HNHM). 1♀, **India**, Bhimtal, distr. Nainital, Kumaon-Himalaja, 1500 m, 10–22.ix.1986, leg. A. Hauenstein (ZFMK). **E Afghanistan**: 1♂, Sarobi, 1100 m, 13.iv.1961, leg. G. Ebert, Ratzel slide no. GU12312/6m (ZSM); 2♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 27.iv. and 5.vi.1968, M. Müller leg., Vojnits slides nos 19523♀, 19524♀ (SMNK).

This species, which belongs to the *lariciata* group (Bolte 1990), was not hitherto recorded from Afghanistan.

### ***Eupithecia conjunctiva* Hampson, 1895**

*Eupithecia conjunctiva* Hampson, 1895: Fauna of British India (Moths) **3**: 400. Holotype ♀ (BMNH), [India]: Dharmsála.

**Material.** Holotype ♀, **India**, Dharmsála 87–59, *Eupithecia conjunctiva* Hmps. type ♀, BM Geom. slide no. 20315 (BMNH). **SE Afghanistan**: 1♀ Safed Koh, S-Seite, Kotkai, 2350 m, 2.viii.1967, M. Müller leg., Vojnits slide no. 19501♀ (HNHM), 1♂, same data, 1.vi.1968, Vojnits slide no. 17540♂ (SMNK).

This species of the *lariciata* group is found in northern Pakistan, Jammu and Kashmir, northern India (Punjab, Sikkim), and Nepal from about 1100 m to about 3000 m above sea-level. A new species for the fauna of Afghanistan. The male genitalia were described and illustrated in Inoue (2000) for the first time.

### ***Eupithecia karnaliensis* Inoue, 2000**

*Eupithecia karnaliensis* Inoue, 2000: Tinea **16** (Suppl. 1): 34, pl. 165, fig. 21; figs 1299, 1339. Holotype ♂ (coll. Owada; Tokyo), [Nepal]: [Karnali], Jullya, 2690 m.  
Misidentification: *Eupithecia emikoeae* Inoue, 1996 (part paratypes ♂, ♀).

**Material.** Holotype ♂, **Nepal**, Karnali, Jumla Distr., Jillya, 2690 m, 29.ix.1981, M. Owada, Inoue slide no. 14137♂ (NSMT). – Paratypes of *E. emikoeae*: 1♂, **India**, Kashmir, (Kangan-Wayul), Naranag, 2500 m, Aug. 16–18.1982, leg. H. Yoshimoto; 1♀, NW India, Kashmir, Pahalgam-Kolohoi, Lidderwat, 3000 m, Aug. 8–9.1982, leg. E. Yoshimoto (ZISP). **E Afghanistan**: 1♀, Nurisan-Bashgal, 19 km E of Kamu, 1500 m, 20.x.1970, Nr. 1139, leg. C. Naumann E-lep 209, Ratzel slide no. GU25408/2w; 1♂, same locality, vic. Barg-e-Matal, 2200 m, 21.x.1970, Nr. 1140, leg. C. Naumann E-lep 209, Ratzel slide no. GU24408/5m; 1♂, same locality, 18 km E of Kamu, 1500 m, 29.x.1970, leg. C. Naumann, Coll.-Nr. 1147, Ratzel slide no. GU24408/6m (SMNK).

A small mountainous species from the *propagata* group. The similarity and differences of *E. karnaliensis* to and from the allied species *E. caduca* Vojnits, 1984 were described



in detail in Mironov et al. (2008c). The male and female genitalia were described and illustrated in Inoue (2000). This little-known species had so far been recorded only from Great Western Himalaya Mts (Jammu & Kashmir) and Nepal at an altitude of about 2200 m up to about 3200 m above sea-level. First records for Afghanistan.

### *Eupithecia mustangata* Schütze, 1961

*Eupithecia mustangata* Schütze, 1961: Veröffentlichungen der zoologischen Staatssammlung München 6: 181, pl. 29, figs 4, 9; pl. 31, fig. 4; pl. 32, fig. 1. Holotype ♂ (ZSM), [Nepal]: Mustangbhot, 29°11'N, 83°58'E, Muktinath, 3500 m.

*Eupithecia emikoae* Inoue, 1996: Transactions of the Lepidopterological Society of Japan 47 (4): 237, figs 1, 2, 8, 11. Holotype ♂ (coll. H. Inoue in BMNH), [India/Pakistan]: Kashmir, Pahalgam-Kolohoi, Lidderwat (synonymised in Mironov et al. 2008a).

**Material.** Holotype ♂, **Nepal**, Mustangbhot, 29°11'n.Br. 83°58'ö.L., Muktinath, 3500 m, 5.viii.1955, leg. F. Lobbichler, Zoolog. Staatsslg., *mustangata* Schü. Holotypus. Präp. Nr. A 707♂ det. E. Schütze, Kassel, ZSM G13367, photo 84 B 27 det. A. Vojnits (ZSM). – Paratype: 1♀, **Nepal**, Mustangbhot, 29°11'n. Br. 83°58'ö.L., Mustang, 3800 m, 14.viii.1955, leg. F. Lobbichler, Zoolog. Staatsslg., *mustangata* Schü. Allotypus. Präp. Nr. A 710♀ det. E. Schütze, Kassel, ZSM G13368, photo 84 B 28 det. A. Vojnits (ZSM). – Holotype of *E. emikoae* ♂, **India**, Kashmir, Pahalgam-Kolohoi, Lidderwat (3000 m), Aug. 8–9.1982, leg. E. Yoshimoto, Inoue Coll. B.M. 1992–71, Type status verified K. Buckmaster 1997, BM Geom. slide no. 22012 (coll. H. Inoue in BMNH). **NE Afghanistan**: 1♂, 1♀, Badachschan, Bela Kuran, 2900 m, 12–29. vii.1963, leg. K. Omoto (ZSM); 1♂, E-Afghanistan, Nuristan, Bashgal, vic. Barg-e-Matal, Dandizenor, 3300 m, 13.vii.1970, Nr. 1122, leg. C. Naumann, Ratzel slide no. GU9408/5m; 1♀, NE Afghanistan, Wakhan-Tal, Sarhad, 3150 m, 6.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 232; 1♂, 5♀, same locality, 3300 m, Zemestani Baharak, 23, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 261 and 262; 3♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263; 8♂, 28♀, same locality, 3400 m, Kotal-e-Dalez, W-Seite, 27., 28., 29.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 269, 271 and 272 (SMNK).

This very variable species in size, depth of colour, and the breadth of transverse lines was previously known only from the mountains of northern Pakistan, Jammu & Kashmir, northern India (Himachal Pradesh), and Nepal from about 2100 m up to about 4300 m above sea-level. It is now newly recorded from Afghanistan. The male and female genitalia were described and illustrated in Schütze (1961a).

### *Eupithecia pamirica* Viidalepp, 1988

*Eupithecia pamirica* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 117, pl. 2, fig. 14; text-pl. 26 (*nec* 25 and 32, fig. 11), figs 14–17 (*nec* 8–11). Holotype ♀ (IAET), Tajikistan: Mts. Darwaz, cliv. merid., fl. Wischarvi, 1800 m.

**Material.** Holotype ♀, **Tajikistan**, Mts. Darwaz cliv. merid., fl. Wischarvi, 1800 m, 8.viii.1958, A. Bundel (IAET). – Paratypes: 1♂, same data (ZISP); 1♀, Pamir mer. occ., fl. Gunt, 2700 m, 29.vii.1952, Bundel (ZISP); 1♂, Pamir mer. occ., Chorog, 2500 m, 10.viii.1956, Hortus Botan., A. Bundel (ZISP). **E Afghanistan**: 5♂, Salang-Pass, N-Seite, Khinjan, 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slides nos 17874♂, 17875♂, 17876♂, 17877♂ (SMNK; coll. Ratzel); 1♂, C Afghanistan, Koh-i-Baba, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slide no. 19522♂ (SMNK); 1♂, 1♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 4.viii, 1.ix.1967, M. Müller leg., Vojnits slides nos 16977♂, 19527♀ (SMNK).

This little-known, small species, which is common in the mountainous areas of Central Asia at altitudes from about 1800 m up to about 3500 m above sea-level, has been recorded from Tajikistan (Darvazsky Mts., Ghissarsky Mts., SW Pamirs), Kyrgyzstan (Tchatkal Nature Reserve), and Pakistan (Deosai Mts., Great West. Himalaya Mts.,

Karakoram Mts.). These are new records for Afghanistan. The details of the male and female genitalia were described and illustrated by Viidalepp (1988).

***Eupithecia tabestana* Mironov & Ratzel, sp. n.**

**Figs 2, 3, 17, 21**

Misidentification: *Eupithecia anemica*: *sensu* Mironov et al. 2008b (*nec* Viidalepp 1988).

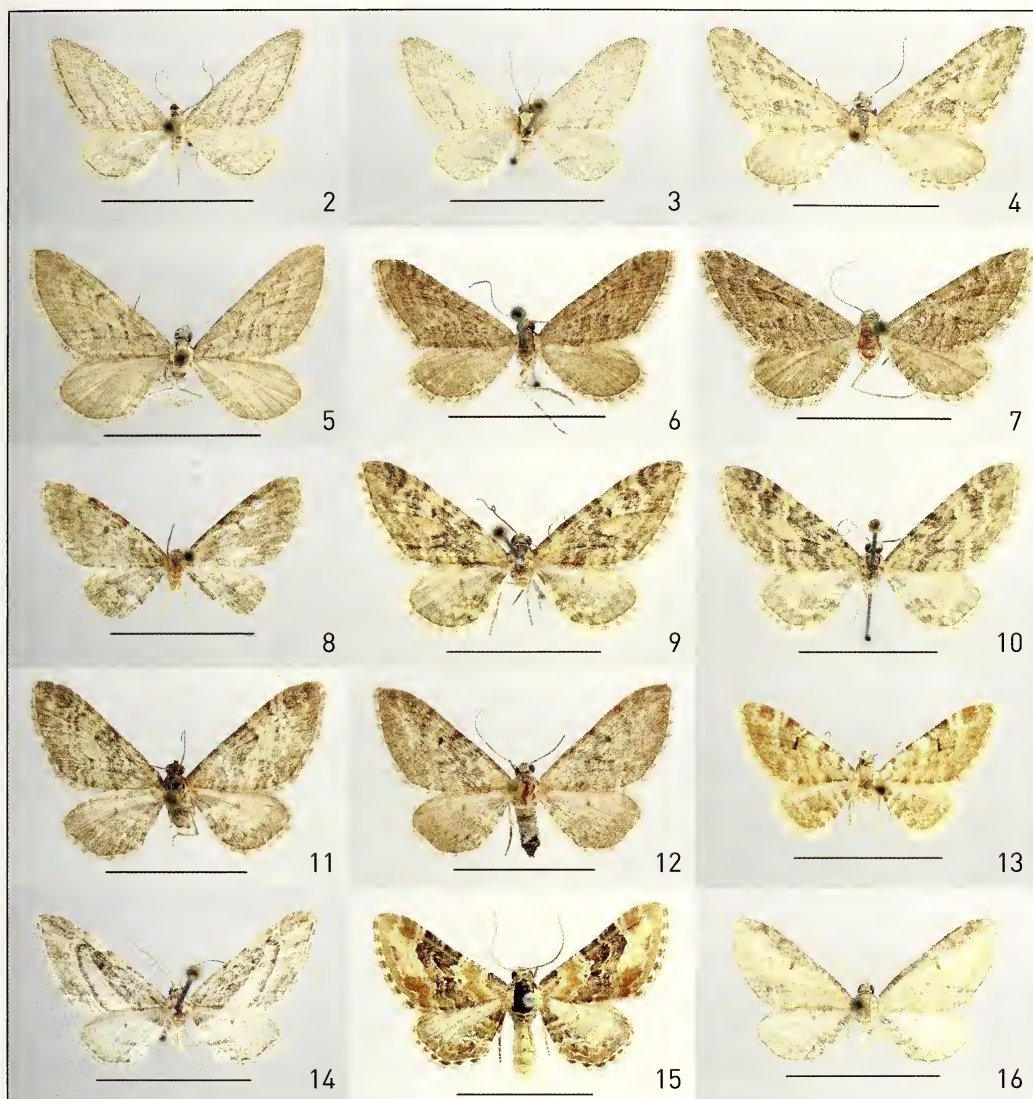
**Material.** Holotype ♀, NE Afghanistan, Wakhan-Tal, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263; *Eupithecia anemica* Viid., Ratzel slide no. GU9208/1w, det. U. Ratzel (coll. Ratzel). – Paratypes: 1♀, SE Afghanistan, Prov. Paktia, 2350 m, Safed Koh, S-Seite, Kotkai, 16–17. vi.1971, Ebert & Naumann, UV-Li, Ratzel slide no. GU9208/3w (SMNK); 2♂, 4♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 23, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 261 and 262, Ratzel slides nos GU291109/7m, GU291109/2w, GU9208/2w, Mironov slide no. 864♂ (SMNK; 1♂ and 1♀ in ZISP). 2♀, Pakistan, West, Great Himalaya Mts., Near Gabar, 3200 m, 21–24.viii.2004, leg. Gurko, coll. Ratzel, Ratzel slides nos GU9705/1w, GU9705/2w; 1♂, NE Pakistan, Az. Jammu & Kashmir, n. Jankar, 4200–4500 m, 10–20.viii.2009; leg. Gurko (coll. Ratzel); 1♂, NE Pakistan, Az. Jammu & Kashmir, Kaghan valley, n. Naran, 2800 m, 19–20.viii.2009, leg. Gurko (coll. Ratzel). **Nepal**, Dhaulagiri: 1♀ above Marpha, Yak Kharka, 3850 m, 15.vi.2012, Ratzel slide no. GU24912/1w, 1♀ Mukthinath Himal, Lupra, Bonpo Gompa, 3150 m, 12.vi.2012, Ratzel slide no. GU24912/2w, leg. Balász Benedek (coll. Ratzel).

**Description.** Wingspan 15.0–17.0 mm; length of forewing 8.0–9.0 mm. Labial palpi short, about two times shorter than diameter of eye, covered with light brown scales. Frons, vertex, and notum almost unicolorous, yellowish white. Forewing narrow, elongated, with straight costal margin, almost straight, oblique termen and pointed apex; evenly unicolorous, pale yellowish grey, irrorated by numerous light brown scales; transverse lines invisible except very narrow, light brown, oblique ante- and postmedial; discal dot absent. Hindwing narrow, elongated, paler, also unicolorous yellowish grey, irrorated with light brown scales, with more or less visible, light brown, medially right angled onto costa postmedial transverse line only; discal dot invisible; terminal lines on all wings brown; fringe pale, yellowish grey, almost dirty white, slightly chequered light brown. Abdomen unicolorous, yellowish white.

**Male genitalia** (Fig. 17). Uncus medium-length, narrow, biapical. Valve shaped like a lemon segment, relatively small, narrow, with almost parallel dorsal and ventral margins; apex rounded; sacculus weakly sclerotized. Vinculum short, medium width, semicircular. Papillae on the anterior arms of the labides small, covered with sparse setae at apices. Phallus small, slim, much shorter than length of valve. Vesica armed with one small piece near ductus ejaculatorius base, one elongated and narrow, oblique plate-like cornutus, one heavily-sclerotized horn-like cornutus and two apical horn-like cornuti of original shape. Sternite A8 small, elongated, with almost parallel lateral margins, slightly asymmetrical basal lobes and two short, narrow, spine-like, sclerotized and diverging apical rods.

**Female genitalia** (Fig. 21). Bursa copulatrix small, ovate-oblong, membranous, with four patches of spines: the basal patch with very small and almost invisible spinules, two elongated lateral patches of larger and longer spines, and one transverse patch of very small, short spines from base of ductus seminalis to base of colliculum. Ductus bursae indistinguishable from corpus bursae. Ductus seminalis very broad, broadly attached to the middle of corpus bursae. Colliculum collar-like, small and relatively short. Antrum membranous. Tergite A8 small, trapezoid. Anterior and posterior apophyses short and narrow. Papillae anales small, short, rounded, covered with short setae.





**Figs 2–16.** Adults of *Eupithecia* species (scale bar = 10 mm). 2. *E. tabestana* Mironov & Ratzel, sp. n. (holotype, ♀). 3. *E. tabestana* Mironov & Ratzel, sp. n. (paratype, ♂). 4. *E. obtinens* Brandt, 1941 (♀). 5. *E. assectata* Dietze, 1904 (♀). 6. *E. fredii* Mironov & Ratzel, sp. n. (holotype, ♂). 7. *E. fredii* Mironov & Ratzel, sp. n. (paratype, ♀). 8. *E. infecunda* Vojnits, 1981 (♀). 9. *E. xanthomixta* Vojnits, 1988 (♀ from type-locality). 10. *E. xanthomixta* Vojnits, 1988 (♀ from type-locality). 11. *E. naumanni* Mironov & Ratzel, sp. n. (holotype, ♀). 12. *E. naumanni* Mironov & Ratzel, sp. n. (paratype, ♀). 13. *E. nachadiria* Brandt, 1941 (♀). 14. *E. decipiens* Petersen, 1910 (♂). 15. *E. subpulchrata* Alphéraky, 1883 (♀). 16. *E. ochrovittata* Christoph, 1887 (♂).

**Diagnosis.** This species appears to belong to the *fletcherata* group and is externally very similar to *E. anemica* Viidalepp, 1988, but clearly distinguished from it by the complete absence of medial transverse lines and discal dots on forewings. The male genitalia of *E. tabestana* have a longer uncus, longer valve with broader apex, straight horn-like cornutus and two different apical cornuti on the vesica of phallus than in *E.*



*anemica*; the apical rods of the eighth sternite are straight and diverging (in *E. anemica* they are pincers-like). The female genitalia of *E. tabestana* can be distinguished from those of *E. anemica* by the broader ductus seminalis, smaller medial patches of spines in the corpus bursae, and also trapezoid eighth tergite.

**Distribution.** East Afghanistan, northern Pakistan, and central Nepal.

### *Eupithecia obtinens* Brandt, 1941

Fig. 4, 22

*Eupithecia obtinens* Brandt, 1941: Mitteilungen der Münchner entomologischen Gesellschaft **31** (3): 875, pl. 29, fig. 28. Holotype ♂ (NHRS), [Iran]: Kouh i Binaloud, 2500–3300 m.

*Eupithecia eberti* Vojnits, 1978 **syn. n.**: Acta Zoologica Academiae Scientiarum Hungaricae **24** (3–4): 436, fig. 7. Holotype ♂ (HNHM), Iran (northeast): Kuh i Mirabi, 2200 m.

Incorrect subsequent spelling: *obtinens*: Mohammadian (2006).

Misidentification: *Eupithecia sutiliata*; sensu Schütze 1961b (*nec* Christoph 1877).

**Material.** Holotype ♂, **Iran**, Khorassan, Kouh i Binaloud (Meched), 2800 m, 18. Juli 1938, Coll. Brandt, 96./57, coll. RMS, Holotype *Eupithecia obtinens* Brdt. Brandt, R.M. prep. 4916, *sutiliata* Chr. Präp. Nr. A 898♂ det. E. Schütze, Kassel, photo 28 A 80 det. A. Vojnits (NHRS). – Paratypes: 1♀, Iran, Khorassan, Kouh i Binaloud (Meched), 2500 m, 16. Aug. 1938, Coll. Brandt, coll. RMS, Allotype *Eupithecia obtinens* Brdt. Brandt, 52, photo 29 A 80 det. A. Vojnits; 1♀, same locality, 2800 m, 15. Juli 1938, Coll. Brandt, Paratype *Eupithecia obtinens* Brdt. Brandt, 53; 1♂, same locality, 3000 m, 25.vii.1938, coll. Brandt, Paratype *Eupithecia obtinens* Brdt. Brandt, Vojnits slide no. 744♂ (NHRS); 1♀ (?), Iran, Khorassan, Kouh i Binaloud (Meched), 3000 m, 30.vii.1938, coll. Brandt, Brit. Mus. 1964, 454 (BMNH). – Holotype of *E. eberti* ♂, **Iran**, Kuh i Mirabi, Geröllzone, 2200 m, Juli-Anf. Aug., Exp. Wernicke, Vojnits slide no. 11342♂ (HNHM). **NE Afghanistan**: 3♀, Badachschan, Bela Kuran, 2900 m, 12–29.vii.1963, leg. K. Omoto (ZSM); 2♂, 1♀, C Afghanistan, Koh-i-Baba, S-Seite, Shah-tu-Pass, 3000 m, 17–19.vii.1966, G. Ebert leg., Vojnits slides nos 17563♂, 19510♂, 17562♀ (SMNK); 1♂, centr., Band-i-Amir, 67°L / 34°25'B, 2800 m, 15–16.vii.1971, leg. Vartian, Vojnits slide no. 15106♂ (HNHM); 1♀, Salang, 2700 m, 3–6.vii.1975, leg. W. Thomas (coll. Sommerer).

Brandt has described only the habitus of this species. The male genitalia were described and illustrated by Schütze (1961b) on the basis of slide A898♂ for the first time. However, Schütze treated this species as *E. sutiliata* Christoph, 1877 and synonymised the species name *E. obtinens* with this later in the text erroneously. In fact, two type-specimens (lectotype male and paralectotype female) of *E. sutiliata* are deposited, respectively, in the collections of ZISP (Saint Petersburg) and BMNH (London), from where Schütze did not study any material. Later on, the male genitalia of *E. obtinens* were described and illustrated by Vojnits (1978) again as *E. eberti*. The female genitalia of *E. obtinens* were previously unknown. We therefore include a description and illustration of the female genitalia.

**Female genitalia** (Fig. 22). Bursa copulatrix relatively large, pouch-like, evenly tapered to colliculum, with characteristic heavily sclerotized, rounded protuberance on one side near base, and with patch of longer spines in this protuberance; corpus bursae about one half covered with slim spines. Ductus bursae not distinctly separated from corpus, with one or two patches of small spines near base of colliculum. Ductus seminalis narrow, slightly broadened basally, attached to medium part of corpus bursae opposite of heavily sclerotized basal sack. Colliculum collar-like, rather short and broad. Antrum short and broad, membranous. Tergite A8 rectangular, with rounded posterior corners. Anterior and posterior apophyses very narrow, medium length, tapered apically. Papillae anales narrow, short, rounded, covered with medium-sized setae.

***Eupithecia assectata* Dietze, 1904****Fig. 5**

*Eup[ithecia] assectata* Dietze, 1904: Deutsche entomologische Zeitschrift, Iris (1903) 16 (2): 346, pl. 3, figs 20, 21. Syntypes 7, ♂, ♀ (coll. K. Dietze in MNHU), Central Asia [Uzbekistan]: Tura; Samarkand; [Kyrgyzstan]: (near lake) Issyk-Kul; Togus-torau (Kogard-tau).

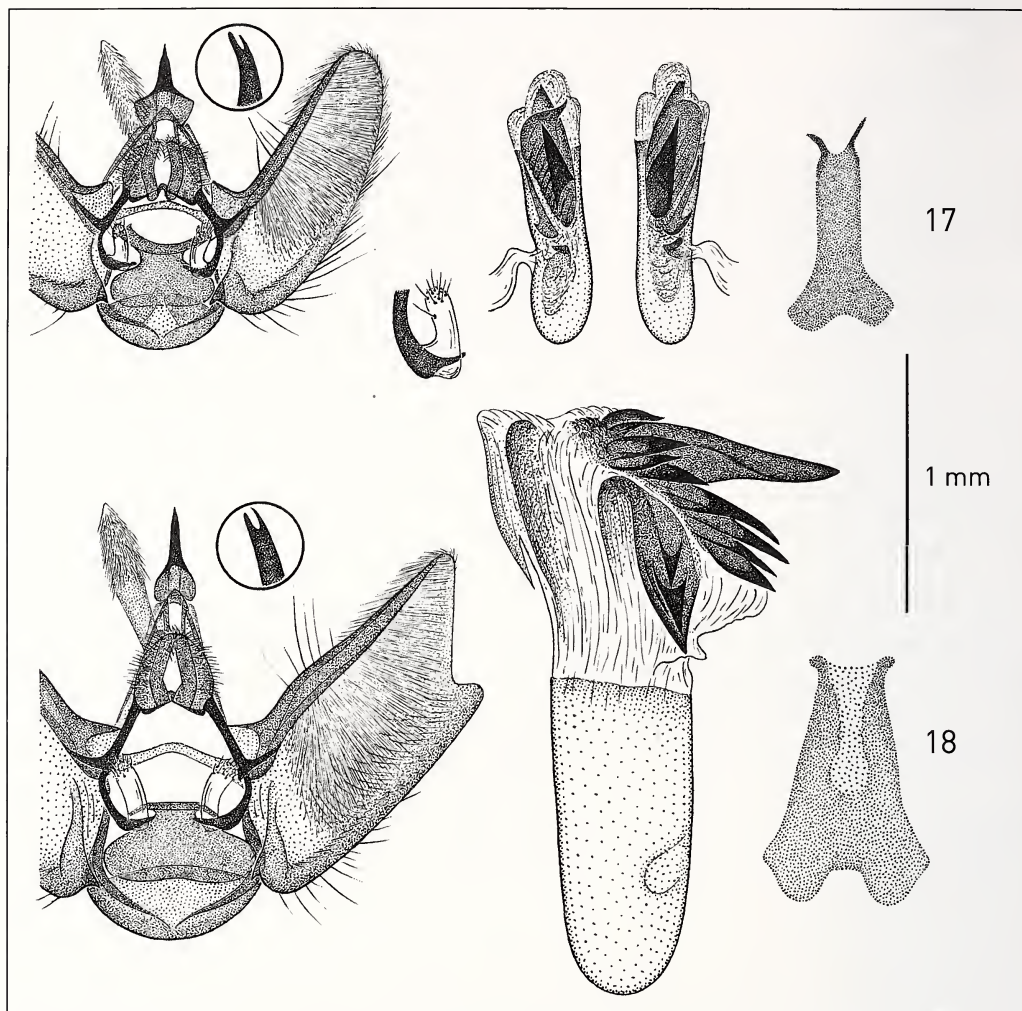
**Material.** Syntypes: 1♂, Asia, **Uzbekistan**, Samarkand, E 1893, 21, 32, *assectata* n. sp., Original (K. Dietze), ♀ hat Stgr auch von Samarkand A205 Hbhr., Genital-Unters. Nr. Eu 72, Zool. Mus. Berlin. 1♀, **Kyrgyzstan**, Togus Tjurae, Kogard Tau, *assectata* n. sp. Type (coll. K. Dietze in MNHU). **Afghanistan**: 1♂, Pagman-Gebirge (Kabul), ca. 3000 m, Juni–Juli 1942, coll. Brandt, R.M. prep. 4912, 7474 E94+, *E. subundata* Schü., Präp. Nr. S 1208♂ det. E. Schütze, Kassel, Monotypus *Eup. subundata* Schü. (undescribed), E. Schütze, Kassel, Naturhistoriska Riksmuseet Stockholm, Loan no 367/06 (NHRS); 1♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 14–17.viii.1966, G. Ebert leg., Vojnits slide no. 19535♀; 1♂, 2♀, E Afghanistan, Salang-Nord, 2100 m, vic. Khindjan, 13.vi.1970, leg. C. Naumann, Nr. 1067, Ratzel slides nos GU25911/1m, GU1109/5w, GU25911/2w; 6♂, 8♀, NE Afghanistan, Prov. Badakhshan, 15 km NE of Baharak, Kotal-e-Zardeu, 3000 m, 28, 30.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 226 and 230, Ratzel slides nos. GU301011/1m, GU301011/2m, GU301011/3w, GU301011/4w, GU41111/1w; 2♀, C Afghanistan, Koh-i-Baba, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slides nos 17764♀, 19488♀; 1♂, E Afghanistan, Salang-Pass, N-Seite (Khinjan), 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slide no. 19494♂; 4♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 10, 23.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242 and 261, Ratzel slide no. GU24911/6w; 1♀, same locality, Sarhad, 3150 m, 9.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 240 (SMNK).

This is a very variable species, forewings varying from pale grey unicolorous almost without pattern to specimens with dark grey colouration and very distinct blackish transverse lines on the forewings. According to structure of the female and male genitalia, especially rows of horn-like cornuti on the vesica, this species belongs to the *fletcherata* group and at least appears related to *E. obtinens* Brandt, 1941. The male and female genitalia were described and illustrated in De Laever (1960) and afterwards in Viidalepp (1988). This is a Central Asian mountainous species distributed in Uzbekistan, Tajikistan, Kyrgyzstan, Afghanistan, and Kashmir at altitude from about 2350 m up to about 3750 m above sea-level. First records for Afghanistan.

***Eupithecia fredii* Mironov & Ratzel, sp. n.****Figs 6, 7, 18, 23**

**Material.** Holotype ♂, **Afghanistan**, Pagman-Gebirge, 25 km NW of Kabul, ca. 2500 m, 17.vi.1941, leg. Fred Brandt, Vojnits slide no. 17031♂ (SMNK). – Paratypes: 8♂, 3♀, same data, Vojnits slides nos 17027♂, 17028♂, 17030♂, 17034♂, 17035♂, 17036♂, 17037♂, 17038♂, 17029♀, 17032♀, 17033♀ (SMNK; 1♂ and 1♀ in ZISP); 1♂, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 1.ix.1967, M. Müller leg., Vojnits slide no. 16969♂ (SMNK).

**Description.** Wingspan 18.0–22.5 mm; length of forewing 9.0–11.5 mm. Labial palpi equal or shorter than diameter of eye, covered with mixture of light brown and grey scales. Frons, vertex, patagia, and notum pale grey with scattered brown scales. Forewing narrow, elongated, with straight costal margin, curved near apex only, almost straight, oblique termen and pointed apex; ground colour brownish grey; transverse lines oblique, slightly wavy posteriorly, right or sharply angled onto costa; medial line usually more sinuate, oblique, and sharply angled onto costa, terminal area with almost straight or slightly wavy, oblique whitish subterminal line; discal dot usually invisible. Hindwing ovoid, almost unicolorous, brownish grey but lighter than forewing; terminal area slightly darker; transverse lines indistinct except ante- and postmedial at anal margin; discal dot invisible. Fringe on all wings distinctly chequered brownish grey and dirty white.



**Figs 17–18.** Male genitalia of *Eupithecia* species (scale bar = 1 mm: with sternite A8, and lateral view of uncus and papillae on the anterior arms of labides enlarged). 17. *E. tabestana* Mironov & Ratzel, sp. n. 18. *E. fredii* Mironov & Ratzel, sp. n.

Male genitalia (Fig. 18). Uncus narrow, elongated, biapical. Valve medium-sized, with almost straight and parallel costal and ventral margins; ventral margin with obtuse process placed near apex of valva; apex of valva very narrowly rounded; sacculus rather sclerotized (see remarks). Vinculum short, broad, semicircular. Papillae on the anterior arms of the labides medium-sized, covered with short setae at apices. Phallus large, broad, almost equal to valval length. Vesica armed with one elongated plate-like cornutus and some horn-like, heavily sclerotized cornuti, which group into two rows (one longer than other with one much larger and longer cornutus). Sternite A8 short and broad, with two broad, sharply tapered and slightly apically diverging arms; basal emargination relatively narrow and deep; apical hollow membranous, narrow and deep.



**Female genitalia** (Fig. 23). Bursa copulatrix pouch-like, relatively small, short and broad, sclerotized, with numerous longitudinal wrinkles, armed with two patches of spines (one basal along anterior wall of bursa of slim spines with much larger some lateral spines on both sides, and other smaller, oblique patch of small spines near base of colliculum). Ductus bursae indistinct from corpus. Ductus seminalis narrow, slightly broadened at base, attached to medium part of corpus bursae. Colliculum collar-like, short and very broad. Antrum short and broad, membranous. Tergite A8 rectangular. Anterior and posterior apophyses short and narrow. Papillae anales relatively small, short and narrow, tapered apically, covered with long and medium-sized setae.

**Diagnosis.** This species appears to belong to the *fletcherata* group. It is externally similar to *E. assectata* Dietze, 1904, but can be distinguished from it by the narrower forewing with more pointed apex and more oblique termen. There are no significant differences in the colouration and pattern of the wings between these species. The male genitalia of the new species are most similar to those of *E. assectata*, but can be distinguished from it by the narrower basal part of uncus, with longer and narrower apical part, very different shape of valva with straight ventral margin almost parallel to dorsal margin, the presence of a short and obtuse process on ventral margin near the apex, which is narrower in the new species than in *E. assectata*. The cornuti on the vesica of *E. fredii* are larger on the whole, with one very large cornutus, which slightly shorter than the phallus of *E. assectata*. The sternite A8 broader, with longer apical arms and deeper basal and membranous apical emargination than in the male of *E. assectata*. The female genitalia of *E. fredii* can be easily separated from those of *E. assectata* by the more sclerotized corpus bursae with longer, numerous longitudinal wrinkles, broader colliculum, the presence of two patches of much larger and longer marginal spines in the spiniferous area and narrower anterior and posterior apophyses.

**Distribution.** East Afghanistan.

**Etymology.** This species is named in honour of the German lepidopterologist Fred Brandt. He was one of the first collectors of Lepidoptera in Afghanistan. There is an interesting story about his collecting of material of *Eupithecia fredii*. Speaking Farsi fluently, in the 1930s F. Brandt was very active in Iran, where he found a lot of new species of Geometridae and Noctuidae. These were described by his brother Wilhelm Brandt, living in Helsinki, Finland. At that time the two of them had a good working relationship with the well-known British lepidopterist E. P. Wiltshire CBE and they dedicated several species to him (e.g. *Idaea wiltshirei* Brandt, 1938 and *Xanthorhoe wiltshirei* Brandt, 1941). Shortly afterwards, as the political climate changed, they found themselves standing on the opposing sides. Fred Brandt visited Afghanistan during the Second World War in the years 1941 and 1942. He was there on an official mission of the German Abwehr (Foreign Intelligence Service). In the night of 18/19 July 1941, together with Dr. M. Oberdörffer, a medical doctor and specialist in tropical medicine, they came under fire in Logar near Kabul (the so called “Logar incident”). Fred Brandt was badly injured, and his partner died. Four weeks before this, Brandt remarkably found time to collect moths in the Paghman area! The main part of the type series of *Eupithecia fredii* was collected there in that period. Nearly all other specimens from this collecting event were lost.

**Remarks.** All Vojnits slides of genitalia in the type-series of this species were boiled for too long, and unfortunately this left crucial details barely, if at all, visible.

### *Eupithecia nepalata* Schütze, 1961

*Eupithecia nepalata* Schütze, 1961: Veröffentlichungen der zoologischen Staatssammlung München 6: 179, pl. 29, figs 1, 6; pl. 30, figs 1, 1a, 1b, 2. Holotype ♂ (ZSM), Nepal: Mustangbhot, 29°11' n, Br. 83°58' ö.L., Kehami, 3700 m.

*Eupithecia abundeli* Vojnits, 1988: Annales Historico-Naturales Musei Nationalis Hungarici 80: 83, pl. 2, figs 13, 14; pl. 6, figs 41–44. Holotype ♀ (ZISP), [Tajikistan]: Pamir, Schach-Darensis Mts, Cliv. Sept., Badjond-Dara River, 3500 m (synonymised in Mironov et al. 2008b).

*Eupithecia petrensis* Mironov, 1989: Entomologicheskoe Obozrenie 68 (2): 371, figs 9–11. Holotype ♂ (ZMMU), Tajikskaya SSR [Tajikistan]: Khorog, Botanical Garden (synonymised in Mironov et al. 2008b).

**Material.** Holotype ♂, Nepal, Mustangbhot, 29°11' n. Br., 83°58' ö. L., Kehami, 3700 m, 12.viii.1955, leg. F. Lobbichler, ZSM slide no. G3892♂ (ZSM). – Paratype: ♂, Nepal, Mustangbhot, 29°11' n.Br., 83°58' ö.L., Penga, 3800 m, 8.viii.1955, leg. F. Lobbichler (ZSM). – Holotype of *E. abundeli* ♀, Tajikistan, Pamir, Mts. Schach-Darensis, cliv. sept., fl. Badjond-Dara, 3500 m, 31.vii.1961, Bundel, Vojnits slide no. 17689♀ (ZISP). – Holotype of *E. petrensis* ♂, Tajikistan, Khorog, Botanical Garden, 24.vii.1958, leg. A. Tzvetajev (ZMMU). NE Afghanistan: 2♂, Badachschan, Bela Kuran, 2900 m, 12–29.vii.1963, leg. K. Omoto (ZSM); 1♀, E Afghanistan, Nuristan: Bashgal, vic. Barg-e-Matal: Dandizenor, 3000 m, 13.vii.1970, Nr. 1122, leg. C. Naumann, Ratzel slide no. GU24911/8w (SMNK); 2♂, 15♀, Wakhan-Tal, 3300 m, Zemestani Baharak, 23, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 261 and 262, Ratzel slides nos GU12208/3m, GU9208/6w, GU15208/1w, GU15208/2w, GU15208/4w, GU24911/1w (SMNK and coll. Ratzel); 3♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263, Ratzel slide no. GU14208/3w (coll. Ratzel).

A Central Asian mountainous species, which is externally similar to the common *E. relaxata* Dietze, 1904. It had hitherto been recorded from Tajikistan, northern provinces of Pakistan and India, and from Nepal. It has not been previously recorded from Afghanistan.

### *Eupithecia thermosaria* Hampson, 1903

*Eupithecia thermosaria* Hampson, 1903: Journal of the Bombay Natural History Society 14 (4): 644. Holotype ♀ (BMNH), [India]: Kashmir, Kokser.

*Eupithecia jaani* Mironov, 1989: Entomologicheskoe Obozrenie 68 (2): 370, figs 5–8, 13. Holotype ♂ (ZISP), Tadzhijskaya SSR [Tajikistan]: Vanchsky Mts, Abdukagor Ravine, Dal'nee, 2900 m (synonymised in Mironov et al. 2008b).

Misidentification. *Eupithecia scortillata*: sensu Viidalepp 1988 (nec Dietze 1904).

**Material.** Syntypes: 1♀, India, Leech Coll. 1900–64, Kashmir, Thompson, Type, *Eupithecia thermosaria* Hmps. type ♀, Figured in Seitz, Vol. 4, BM Geom. slide no. 11805; 1♀, Kokser, H McArthur coll., July 1888 (BMNH). – Holotype of *E. jaani* ♂, Tajikistan, Wantsch, fl. Abdukagor, loc. Dalnee, 2900 m, 9.viii.1955, A. A. Bundel, *E. scortillata*?, 47, Viidalepp praep. no. 2347♂ (ZISP). – Paratypes of *E. jaani*: 3♂, 1♀, same locality, 9, 10.viii.1955, A. A. Bundel, Viidalepp praep. no. 2348♀; 1♂, Pamir merid. occid., Mts. Schachdarensis cliv. sept., fl. Seidj-Dara, 3250 m, 27.vii.1957, A. Bundel, Viidalepp praep. no. 2355♂; 1♂, same locality, fl. Schobeg, 2500 m, 5.viii.1959, A. A. Bundel; 1♀, Darwaz occid., Mts. Chazreti-Scho, fl. Don Duschkan, 25.vii.1959, 2200 m, A. A. Bundel, Viidalepp praep. no. 2339♀; 1♀, Ghissarsky Mts., Takobskoe gorge, 12.viii.1953, Potopolsky, Viidalepp praep. no. 2354♀; 1♀, Pamirian highway, vill. Alichur, 25.vii.1980, V. Prasolov, Viidalepp praep. no. 2595♀ (ZISP). C Afghanistan: 1♂, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slide no. 19556♂ (SMNK); 3♂, 1♀, same locality, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slides nos 17761♂, 17762♂, 17763♂, 19532♀ (SMNK; coll. Ratzel); 1♀, same data, Vojnits slide no. 19533♀ (HNHM); 1♂, E Afghanistan, Nuristan, Bashgal, vic. Bang-e-Matal, Jandizenor, 3000 m, 13.vii.1970, Nr. 1122, leg. C. Naumann; 1♂, 1♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 10.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242, Ratzel slide no. GU291109/5m; 1♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263, Ratzel slide no. GU291109/3w

(SMNK); 2♀, same locality, 3400 m, Kotal-e-Dalez, W-Seite, 27.vii.1971, Ebert & Naumann, UV-Li, coll. Nr. 269 (SMNK; coll. Ratzel); 1♂, same locality, Sargaz, 2930 m, 11.viii.1971, UV-Li, Ebert & Naumann, coll. Nr. 290 (SMNK).

This species has hitherto been recorded from Jammu & Kashmir, Kyrgyzstan, and Tajikistan. It had not previously been recorded from Afghanistan. It is distributed in the mountains at altitudes from 2800 up to 4500 m above sea-level. The details of the male (phallus, cornuti, and eighth sternite) and female (corpus bursae) genitalia of *E. thermosaria* were described and illustrated in Viidalepp (1988) erroneously as *E. scortilata* Dietze, 1904. Later, this species was described again as *E. jaani* Mironov, 1989.

### *Eupithecia costipicta* Warren, 1893

*Eupithecia costipicta* Warren, 1893: Proceedings of the Zoological Society London 1893 (2): 383, pl. 30, fig. 21. Holotype ♀ (BMNH), [India]: Sikkim, 8000 ft.

Material. Holotype ♀, **India**, Sikkim, O. Möller, 8000, 89, *Eupithecia costipicta* Warr. Type ♀, Collectio H. J. Elwes, BM Geom. slide no. 20130 (BMNH). SE **Afghanistan**: 1♀, Safed Koh, S-Seite, Kotkai, 2350 m, 9.ix.1967, M. Müller leg., Vojnits slide no. 17567♀ (SMNK).

This is a rare Asian mountainous species, which belongs to the *subfuscata* group and is distributed in Jammu & Kashmir, Nepal, India (Sikkim), and Central China (Hubei, Hunan) from about 2300 m up to about 3500 m above sea-level. Not hitherto known from Afghanistan.

### *Eupithecia vivida* Vojnits & De Laever, 1978

*Eupithecia vivida* Vojnits & De Laever, 1978: Acta Zoologica Academiae Scientiarum Hungaricae 24 (1–2): 238, figs 18, 20. Holotype ♀ (ZFMK), China: North Yunnan, Li-kiang.

*Eupithecia producta* Vojnits, 1981: Annales Historico-Naturales Musei Nationalis Hungarici 73: 222, fig. 3. Holotype ♀ (SMNK), India (north): Kumaon Bhimtal (Nainital), 1450 m. [Junior primary homonym of *Eupithecia producta* Bastelberger, 1911; Peru.]

*Eupithecia wolffi* Vojnits, 1985: Acta Zoologica Hungarica 31 (1–3): 272. [Replacement name for *Eupithecia producta* Vojnits, 1981] (synonymised in Mironov et al. 2008b).

Material. Holotype ♀, **China**, Provinz Nord-Yuennan, Li-kiang [Lijiang], X, 17.iii.1935, H. Höne, Vojnits slide no. 11057♀ (ZFMK). – Paratypes: 13♂, 12♀, same locality, 26–27, 30.viii, 24.ix.1934, 9., 11., 13–14., 17–19., 21–25., 28., 31.iii, 2–3, 5, 20.iv.1935, H. Höne, Vojnits slides respectively nos 10901♂, 10884♂, 11012♂, 11011♀, 11010♀, 10996♂, 11025♀, 10881♂, 10995♀, 11056♀, 10904♀, 11058♀, 11024♀, 11003♂, 11051♂, 11050♀, De Laever slides respectively nos 212♀, 371♂, 222♂, 228♀, 344♂, 221♂, 345♀, 210♀, 209♂ (ZFMK); 11♂, 12♀, same locality, 8–9., 11–14., 19–21., 23–25., 28.iii, 3.iv, 6.ix.1935, H. Höne, Vojnits slides nos 10885♀, 10929♂, 10961♂, 10985♂, 10986♀, 10987♀, 10988♀, 10993♀, 10994♀, 11005♀, 11006♀, 11008♀, 11009♀, 11013♀, 11018♂, 11020♂, 11026♀, 11052♂, 11053♂, 11054♂, 11055♂ (two specimens without abdomens, HNHM); 2♀, Tibet, Batang, Im Tal des Yangtze (ca. 2800 m), 5, 6.iv.1936, H. Höne, Vojnits slides nos 10878♀, 10902♀ (HNHM). – Holotype of *E. producta* ♀, **N India**, Kumaon Bhimtal (Nainital), 1450 m, 23.ix.1973, Lichtfang, leg. S. Richter, Vojnits slide no. 12124♀ (SMNK). – Paratype of *E. producta*: 1♀, same locality, 6.ix.1973, Lichtfang, leg. S. Richter, Vojnits slide no. 12127♀ (HNHM). E **Afghanistan**: 1♂, Nurisan-Bashgal, 19 km E of Kamu, 1500 m, 20.x.1970, Nr. 1139, leg. C. Naumann E-lep 209 (SMNK).

A single small Afghanian specimen of the second or third generation is damaged (without right hindwing and abdomen). The pattern on the forewings is characteristic for *E. vivida*. It is a new species for the fauna of this country.



***Eupithecia infecunda* Vojnits, 1981****Fig. 8**

*Eupithecia infecunda* Vojnits, 1981: *Annales Historico-Naturales Musei Nationalis Hungarici* **73**: 225, fig. 5. Holotype ♀ (SMNK), Pakistan (west): Swat, Kalam, 2000 m.

**Material.** Holotype ♀, W **Pakistan**, Swat, Kalam, 2000 m, 9.vii.1969, leg. G. Ebert, Vojnits slide no. 12091 ♀ (SMNK). **SE Afghanistan**: 2♀, Safed Koh, S-Seite, Kotkai, 2350 m, 1–10.viii.1966, 5.ix.1967, M. Müller leg., Vojnits slides respectively nos 16978♀, 19526♀ (SMNK).

This little-known and rare Asian species was described on the basis of a single female from the western Pakistanian province Swat. Two Afghanian specimens are worn but with well-visible distinctive postmedial transverse lines on all wings. The male of *E. infecunda* is unknown.

***Eupithecia incurvaria* Hampson, 1903****Fig. 24**

*Eupithecia incurvaria* Hampson, 1903: *Journal of the Bombay Natural History Society* **14** (4): 643.

Syntypes 2♀ (BMNH), [India]: Kashmir: Goorais Valley.

*Eupithecia propoxydata* Schütze, 1961: *Veröffentlichungen der zoologischen Staatssammlung München* **6**: 182, pl. 29, fig. 5; pl. 32, figs 2, 2a, 2b. Holotype ♂ (ZSM), Nepal: Manangbhot, 28°40'N, 84°01'E, Sabzi-Chu, 3500 m (synonymised in Mironov et al. 2008b).

**Material.** Syntypes: 2♀, **India**, Goorais Valley, June 1887, J. H. Leech, Leech Coll. 1900–64, one (without abdomen) labeled *Eupithecia incurvaria* Hmps. type ♂ (*sic*) (BMNH). – Holotype of *E. propoxydata* ♂, **Nepal**, Manangbhot, 28°40'N, 84°1' E, Sabzi-Chu, 3500 m, 9.vii.1955, leg. F. Lob-bichler, Zoolog. Staatsslg., *propoxydata* Schü. Holotypus. Präp. № A704♂ det. E. Schütze, Kassel, ZSM G13366, photo 84 B 30 det. A. Vojnits (ZSM). **SE Afghanistan**: 3♂, 4♀, Safed Koh, S-Seite, Kotkai, 2350 m, 14–23.vi.1966, 21.vi–1.vii.1969, G. Ebert leg., Vojnits slides nos 16958♂, 17547♂, 17552♂, 17546♀, 17551♀, 17553♀, 19491♀; 4♀, same locality, 20–25.vi.1967, 16.vi.1968, M. Müller leg., Vojnits slides nos 17559♀, 17560♀; 1♂, E Afghanistan, Nurisan-Bashgal, vic. Barg-e-Matal, 2200 m, Flussaue, 16.vii.1970, Nr. 1125, leg. C. Naumann E-lep 209, Ratzel slide no. GU24911/7m (SMNK).

This species was originally described by Hampson on the basis of two females from Kashmir. It is found in northern Pakistan, Jammu & Kashmir, Nepal, and India (Sikkim) ranging from about 1400 m up to about 3500 m above sea-level. A new species for the fauna of Afghanistan. The male genitalia were described and illustrated in Schütze (1961a) as *E. propoxydata*. The female genitalia are described and illustrated for the first time here.

**Female genitalia** (Fig. 24). Bursa copulatrix small, rounded, almost completely covered with slim spines; marginal spines longer than other. Ductus bursae broad, sclerotized, sharply tapering to colliculum, spineless, but with longitudinal wrinkles. Ductus seminalis broad, membranous, with some small dentates on the inside. Colliculum collar-like, short and narrow. Antrum bowl-shaped, heavily sclerotized, broad and relatively short. Tergite A8 broad, rectangular. Anterior apophyses very short, slightly broadened and flattened at apices; posterior apophyses narrow, medium-sized. Papillae anales relatively small, short, rounded.

***Eupithecia innotata* (Hufnagel, 1767)**

*Phalaena innotata* Hufnagel, 1767: *Berliner Magazin* **4** (6): 616. Syntype(s) lost, [Germany]: Berlin region.

**Material.** **Afghanistan**: 1♂, 3♀, Kabul, K.-e.-char, 30.iv.1970, leg. C. Naumann E-lep 209, prep. Ratzel 2008, Ratzel slides nos GU9408/1w, GU9408/2w, GU9408/3w (SMNK).

A very common West Palaearctic species ranging from Spain in the west to western Siberia in the east. However, it has not been previously recorded from Afghanistan or Central Asia on the whole.

### *Eupithecia parallelaria* Bohatsch, 1893

[*Eupithecia*] *unedonata* var. *parallelaria* Bohatsch, 1893: Deutsche entomologische Zeitschrift, Iris 6 (1): 22. Lectotype ♀ (designated by Vojnits, coll. R. Püngeler in MNHU), locality not designated for lectotype.

Misidentification: *Eupithecia unedonata* f. *famelica* Dietze, 1910 (1 ♀ paralectotype in coll. K. Dietze in MNHU); *Eupithecia mystica* Vojnits, 1988 (nec *Eupithecia gemellata* f. *mystica* Dietze, 1910) (at least 3 ♀ paratypes from Turkmenistan in ZISP).

**Material.** Lectotype (designated by Vojnits) ♀, Type ♀: Iris 1893, v. *parallelaria* Bohatsch, Origin., Zool. Mus. Berlin, Vojnits slide no. 13574♀ (coll. R. Püngeler in MNHU). E **Afghanistan**: 1 ♂, Nuristan, Bashgal, 18 km E of Kamu, 1500 m, 29.70[sic!].1970, leg. C. Naumann, Coll. Nr. 1147, Ratzel slide no. GU25408/5m; 1 ♂, Sarobi, 18.x.1957, Frau Dr. Wegner leg.; 3 ♂, 2 ♀, same locality, 15., 22.x, 5., 13.xi.1961, ML, Ratzel slides nos GU13408/2m, GU13408/3m (SMNK); 1 ♀, same locality, 19.x.1961 (ZSM).

There is a series of small specimens of the second generation in the Afghanian material in SMNK and ZSM. A new species for the fauna of Afghanistan. The male and female genitalia were described and illustrated by Vojnits (1988).

### *Eupithecia praesignata* Bohatsch, 1893

[*Eupithecia*] *praesignata* Bohatsch, 1893: Deutsche entomologische Zeitschrift, Iris 6 (1): 21. Lectotype ♀ (designated by Vojnits, coll. O. Staudinger in MNHU), [Central Asia]: type locality not designated [Replacement name for *Eupithecia insignata* Bohatsch, 1893].

[*Eupithecia*] *insignata* Bohatsch, 1893: Deutsche entomologische Zeitschrift, Iris 6 (1): 21 [Junior secondary homonym of *Phalaena Geometra insignata* Hübner, 1789].

Misidentification: *Eupithecia parallelaria* Bohatsch, 1893 (2 ♂ paralectotypes in coll. O. Staudinger in MNHU).

**Material.** Lectotype (designated by Vojnits) ♀, Type ♀, Iris 93 *praesignata* Btoch, 55., Origin., Zool. Mus. Berlin, Vojnits slide no. 13571♀ (coll. O. Staudinger in MNHU). – Paralectotype: 1 ♂, **Kyrgyzstan**, Jssyk-Kul, *imnotata* form: *praesignata* Boh., Jssyk-Kul (In Coll. Staudgr. Typen unter sich verschieben), Zool. Mus. Berlin, Vojnits slide no. 13545♂ (coll. K. Dietze in MNHU). NE **Afghanistan**: 5 ♂, 5 ♀, Wakhan-Tal, 3300 m, Zemestani Baharak, 10, 23, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242, 261, 262, Ratzel slides nos GU13408/5m, GU18208/5w; 4 ♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263; 2 ♀, same locality, 3400 m, Kotal-e-Dalez, W-Seite, 27.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 269 (SMNK).

This Central Asian species was previously known from Uzbekistan, Tajikistan, Kyrgyzstan, north-western China (Xinjiang), Jammu & Kashmir, and India (Ladakh Mts.), and is new for Afghanistan. The habitus was illustrated in Dietze (1910). The male and female genitalia were described and illustrated in Vojnits (1982b).

### *Eupithecia mitigata* Dietze, 1906

[*Eupithecia*] *mitigata* Dietze, 1906: Deutsche entomologische Zeitschrift, Iris 19 (2): pl. 2, figs 18, 19; ibidem (1908), 21 (2): 168. Lectotype ♂ (designated by Vojnits, coll. R. Püngeler in MNHU), [China]: Lob-Noor.

Misidentification: *Eupithecia omnigera*: *sensu* Vojnits 1988 (nec Vojnits 1982b) (at least 1 ♂ in ZISP).

**Material.** Lectotype (designated by Vojnits) ♂, Asia centr., **China**, Lob-Noor, E. Mai 1904 Rückbeil. sen. 4/05 v. Tancre, *mitigata* cotype, K. Dietze, Zool. Mus. Berlin, Vojnits slide no. 13587♂ (coll. R.

Püngeler in MNHU). – Paralectotypes: 2♂, same data, *mitigata* cotype, K. Dietze (coll. R. Püngeler in MNHU); 1♂, *mitigata* n. sp. ♂, Type, Lob-noor, Asia centr. (Ende Mai 1904. Rückbeil), K. Dietze, 6., *mitigata* Dtze, präp. Nr. A 827♂, det. E. Schütze, Kassel; 1♂ (*nec* ♀), *mitigata* ♀, Type, Lob-noor, Asia centr., Rückbeil, Ende Mai 1901t., Original., K. Dietze (coll. K. Dietze in MNHU). SE **Afghanistan**: 1♀, Prov. Paktia, 2350 m, Safed Koh, S-Seite, Kotkai, 16–17.vi.1971, UV-Li, Ebert & Naumann; 1♂, 3♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 10., 23.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242 and 261, Ratzel slide no. GU13408/4m (SMNK).

A distinctive unicolorous, dark grey species of the *innotata* group, often wings almost without a clear pattern, but usually with light costal blotch between medial and terminal areas. Hitherto recorded from Tajikistan, Kyrgyzstan, southern Kazakhstan, and north-western China (Xinjiang). New species for the fauna of Afghanistan. Adults were illustrated by Dietze (1906, 1910). The male genitalia were described and illustrated by Vojnits (1982b).

### *Eupithecia tshimganica* Viidalepp, 1988

*Eupithecia tshimganica* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 113, pl. 2, fig. 12; text-pl. 24, figs 5–8. Holotype ♀ (IAET), Uzbeksk. SSR [Uzbekistan]: Chimgan.

*Eupithecia subomnigera* Vojnits, 1988 **syn. n.**: Annales Historico-Naturales Musei Nationalis Hungarici **80**: 80, (*nec* pl. 1: 1–2); pl. 3, figs 21–24. Holotype ♂ (ZISP), [Tajikistan]: Pamirs, Schugnanensis Mts, fl. Akmamed dara, 3500 m.

**Material**. Holotype ♀, **Uzbekistan**, Chimgan, 7 juuni 1979a valguspüük, leg. T. Marnot, Viidalepp slide no. 2621♀ (IAET). – Holotype of *E. subomnigera* ♂, **Tajikistan**, Pamir merid. occid., Mts. Schugnanensis cl. sept., fl. Akmamed Dara, 3600 m, 12.vii.1957, A. Bundel, Vojnits slide no. 17731♂ (ZISP). – Paratype of *E. subomnigera*: 1♀, **Tajikistan**, vic. Stalinabad, Takobskoe gorge, 15.vi.1952, Potopolsky, Vojnits slide no. 17729♀ (ZISP). NE **Afghanistan**: 1♀, Prov. Badakshan, 3000 m, 15 km NE of Baharak, Kotal-e-Zardeu, 30.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 230 (SMNK).

A distinctive, pale, yellowish or yellow-grey species from the *innotata* group. Some known specimens of this species are without a distinct wing pattern. *E. tshimganica* was previously known from Uzbekistan and Tajikistan. First records for Afghanistan. *E. subomnigera* was synonymised here on the basis of the external similarity of the holotype. There are also additional specimens (males and females) of this species in the collection of ZISP from Tien-Shan Mts.

### *Eupithecia relaxata* Dietze, 1904

[*Eupithecia*] *unedonata* var. *relaxata* Dietze, 1904: Deutsche entomologische Zeitschrift, Iris (1903) **16** (2): 367, pl. 5, fig. 17. Holotype ♀ (coll. K. Dietze in MNHU), Central Asia [Iran]: Schakuh.

[*Eupithecia*] *costisignata* Dietze, 1904: Deutsche entomologische Zeitschrift, Iris (1903) **16** (2): 367, pl. 5, figs 18, 19. Syntypes 11, at least 4♂, 3♀ (coll. K. Dietze and R. Püngeler in MNHU), Central Asia [Iran]: Schakuh; [China]: Korla (synonymised in Mironov et al. 2008c).

*Eupithecia pamiri* Vojnits, 1988: Annales Historico-Naturales Musei Nationalis Hungarici **80**: 81, pl. 1, figs 3–5; pl. 4, figs 25–28. Holotype ♂ (ZISP), [Tajikistan]: Pamir merid. occid., Schach-Darensis Mts, Seiojdara River, 3250 m (synonymised in Mironov et al. 2008c).

**Material**. Syntype: ♀, **Iran**, Schakuh, 31.vii.1898, Funke, *costisignata* form. *relaxata*, Typ, Schakuh ♀, 31.vii.1898, Zool. Mus. Berlin, Typus, Gen.-Unters. Nr. [Schmidt slide no.] Eu 104, Zool. Mus. Berlin (coll. K. Dietze in MNHU). – Syntypes of *E. costisignata*: 1♂, **China**, *costisignata*, *costisignata* Korla, Type ♂, Zool. Mus. Berlin, Typus, *Eupithecia costisignata* ♂, Korea, Type, Prep. № 1659.1 E. De Laever det. 1957; 1♀, *costisignata* Korla, *costisignata* ♀ Typ., Korla, *Eupithecia costisignata* ♀, Kor(e)a, Type, Prep. № 1659.2 E. De Laever det. 1957 (coll. K. Dietze in MNHU). – Syntypes of *E. relaxata* var. *costisignata*: 1♀, **China**, Korla, Sai-chin, 372, *costisignata* [hand writing by Dietze] (coll. K. Dietze in MNHU);



3♂, Asia centr., Saichin-Kette nördl. v. Korla, Rückbeil 1902, *relaxata* var. *costisignata* Dietze, **Type** (v. R. Tancre 11.02), subspec: *relaxata* var. *costisignata* Original (Dietze), Zool. Mus. Berlin, Vojnits slide no. 13584♂ (coll. R. Püngeler in MNHU). – Holotype of *E. pamiri* ♂, **Tajikistan**, Pamir merid. occid., Mts. Schach-Darensis, Cliv septr., fl. Seidj-Dara, 3250 m, 27.vii.1957, A. Bundel leg., Vojnits slide no. 17686♂ (ZISP). C **Afghanistan**: 2♂, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slides nos 17774♂, 19517♂; 4♂, 3♀, same locality, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, Vojnits slides nos 17767♂, 17786♂, 19499♂, 19516♂ 17765♀, 17770♀, 17787♀; 1♂, 1♀, E Afghanistan, Salang-Pass, N-Seite (Khinjan), 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slides nos 17873♂, 19496♀; 6♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 1–3., 6, 9.ix.1967, M. Müller leg., Vojnits slides nos 16971♀, 16973♀, 16974♀, 16991♀, 19513♀; 1♀, E Afghanistan, Pr. Kunar, Nuristan, ob(eres) Lindai Sin-Tal, vic. Barg e Matal, Dandizenor Mts., 3100 m, 13–14.vii.1970, leg. Naumann, Coll.-Nr. ZMK 93 (SMNK); 1 ex., Prov. Kadaghan, Salang Paß, Nordseite, 69°L 35°40'B, 11–12.vii.1971, leg. Vartian (HNHM); 6♂, 30 ♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 10, 23, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242, 261, 262, Ratzel slide no. GU31209/3w; 1♂, 9♀, same locality, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 263; 3♂, 19♀, same locality, 3400 m, Kotal-e-Dalez, W-Seite, 27., 29.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 269 and 272; 7♂, 1♀, same locality, Sargaz, 2930 m, 11.viii.1971, UV-Li, Ebert & Naumann, coll. Nr. 290 (SMNK).

This handsome, distinctive and common Central Asian species of the *innotata* group is distributed in Turkmenistan (Kopet-Dagh Mts.), Iran, Tajikistan (Pamirs Mts.), Kazakhstan, Kyrgyzstan (Tien-Shan Mts.), Pakistan (Baltistan), Jammu & Kashmir, India (Ladakh Range), north-western China (Xinjiang), and Mongolia (Mongol Altai Mts.). First records for Afghanistan. It is a bivoltine species with the second generation being smaller than the first. The larvae of *E. relaxata* have been found in scrub woodland on *Amygdalus spartioides* (Rosaceae) in Iran (Wiltshire 1952). The male and female genitalia were described and illustrated in De Laever (1960) for the first time as *E. costisignata*. Later on, Vojnits (1982b) described and illustrated the male and female genitalia of this species also under the name *E. costisignata* but without the eighth sternite of the males. He described this species as a new one under the name *pamiri* again in another publication (Vojnits 1988).

### *Eupithecia lindti* Viidalepp, 1988

*Eupithecia lindti* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 113, pl. 1, fig. 16; text-pl. 24, figs 1–4. Holotype ♂ (IAET), Uzb. SSR [Uzbekistan]: Chimgan spa.

*Eupithecia hangayorum* Vojnits, 1988: Annales Historico-Naturales Musei Nationalis Hungarici 80: 84, pl. 1, figs 1–2 (*nec* pl. 2, figs 15–16); pl. 6, figs 45–48. Holotype ♂ (ZISP), [Tajikistan]: Darwaz occid., Chazret-scho Mts, fl. Don Duschlan, 2200 m (synonymised in Mironov et al. 2008c).

**Material**. Holotype ♂, **Uzbekistan**, kur. Chimgan, 26.vi–1.vii.1981, at light, leg. A. Lindt (IAET). – Holotype of *E. hangayorum* [*hangayae* on the label] ♂, **Tajikistan**, Darwaz occid., Mts. Chazreti-Scho, fl. Don Duschkan, 25.vii.1959, 2200 m, leg. A. A. Bundel, Vojnits slide no. 17748♂ (ZISP). – Paratypes of *E. hangayorum* [*hangayae* on the label]: 1♀, **Tajikistan**, Mts. Darwaz, cliv. Merid., fl. Wischarvu, 1800 m, 3.viii.1958, A. Bundel, Vojnits slide no. 17691♀; 1♀, Pamir occid., fl. Obi-Chingou, Mionadu, 6.viii.1959, 2200 m, A. Bundel, Vojnits slide no. 17674♀; 1♂, 1♀, vic. Stalinabad, Khorangonskoe gorge, 12.viii.1951, Vojnits slides nos 17629♀, 17638♂; 1♂, vic. Dzhirgatal, Dzhul-Terek Pass, 2400 m, 13.vii.1953, Bundel, Vojnits slide no. 17671♂ (ZISP). **Afghanistan**: 1♂, Pagman-Gebirge (Kabul), ca. 3000 m, Juni–Juli 1942, coll. Brandt, R. M. prep. 4914, 7467 E94+, *Eup. afghanata* Schü., Präp. Nr. S 1205♂ det. E. Schütze, Kassel, Holotypus *Eup. afghanata* Schütze (undescribed), ♂, E. Schütze, Kassel, Naturhistoriska Riksmuseet Stockholm, Loan no 361/06; 1♂, same data, R. M. prep. 4915, 7468 E94+, *E. afghanata* Schü., Präp. Nr. S 1222♂ det. E. Schütze, Kassel, Paratypus *Eupith. afghanata* Schütze, ♂, E. Schütze, Kassel, Naturhistoriska Riksmuseet Stockholm, Loan no 362/06 (NHRS); 1♂, same data, 100/57, R. M. prep. 4905, 7469 E94+, spec. ?, *Eup. kabulata* Schü., Präp. Nr. S 1204♂ det. E. Schütze, Kassel, Holotypus *Eupith. kabulata* Schü. (undescribed), E. Schütze, Kassel, Naturhistoriska Riksmuseet

Stockholm, Loan no 363/06; 1♂, same data, R. M. prep. 4906, 7470 E94+, *Eup. kabulata* Schü., Präp. Nr. S 1206♂ det. E. Schütze, Kassel, Paratypus *Eup. kabulata* Schütze, E. Schütze, Kassel, Naturhistoriska Riksmuseet Stockholm, Loan no 364/06; 1♂, same data, R. M. prep. 4904, 7472 E94+, *E. pagmanata* Schü., Präp. Nr. S 1207♂ det. E. Schütze, Kassel, Monotypus *Eup. pagmanata* Schü. (undescribed), Kassel, Naturhistoriska Riksmuseet Stockholm, Loan no 365/06 (NHRs); 1♂, 3♀, Hazaradjat, Koh-i-Baba, Pandjao Umgeb., 2500 m, 26.vi–1.vii.1961, leg. G. Ebert (ZSM); 4♂, 14♀, E Afghanistan, Salang-Pass, N-Seite (Khinjan), 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slides nos 17532♂, 17537♂, 17539♂, 19507♂, 17533♀, 17534♀, 17535♀, 17536♀, 17538♀, 17541♀, 17542♀, 17543♀, 17544♀, 19493♀, 19497♀, 19498♀, 19508♀, 19509♀; 1♀, Kabulfluss, Tamarix-Alhasi-Steppe, 14.vii.1966, Vojnits slide no. 19500♀; 2♂, C Afghanistan, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slides nos 19512♂, 19534♂; 1♂, same locality, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slide no. 19549♂; 1♀, Salang-Nord, 2100 m, vic. Khindjan, 13.vi.1970, leg. Naumann, Nr. 1067, Ratzel slide no. GU25408/6w; 1♂, E Afghanistan, Nuristan, Bashgal, vic. Barg-e-Matal, 3 km W (Seidental), 2500 m, 6.vii.1970, leg. Naumann, Nr. 1106, prep. Ratzel 2008 E-lep 209 (SMNK).

This large species is very similar to the Iranian *E. mahomedana* Brandt, 1938, but is smaller and darker on the whole. Forewings with more pointed apex and almost straight oblique termen; all wings with transverse lines more distinct, almost straight and more oblique, discal dots usually larger and more conspicuous than in *E. mahomedana*. The male genitalia are very similar to those of *E. mahomedana* without any obvious diagnostic differences. The female genitalia can be distinguished from those of *E. mahomedana* by the absence of longitudinal membranous gap dividing in half the main spiniferous area. *E. lindti* was previously known from the mountains of Uzbekistan, Tajikistan, and northern provinces of Pakistan and India. It is a new species for the fauna of Afghanistan.

### *Eupithecia convallata terricolor* Vojnits, 1988

*Eupithecia convallata terricolor* Vojnits, 1988: Acta Zoologica Hungarica **34** (4): 423, pl. 1, figs 5, 6; text-figs 9–12. Holotype ♂ (coll. Vartian, Vienna), Afgh[anistan]: 10 km NW of Kabul, 1900 m.

**Material.** Paratype: 1♂, **Afghanistan**, 10 km NW v. Kabul, 1900 m, 29.v.1965, Kasy & Vartian, Vojnits slide no. 15627♂ (HNHM). 9♂, 4♀, E Afghanistan, Sarobi, 1100 m, 7., 15–16., 19., 21., 24–25., 27., 29.iv.1961, leg. G. Ebert, Ratzel slides nos 12312/3m, 12312/6w, 12312/7w, 13312/1w (ZSM).

This species was originally described from Iran by W. Brandt (1938). Later, Vojnits (1988) described a new subspecies *terricolor* from Afghanistan, which can be distinguished from the nominate subspecies by the less developed wing pattern, broader and less wavy basal, ante- and postmedial transverse lines in the forewing, and the presence of a large light blotch along the anal margin in the medial area between ante- and postmedial lines, also a broader and more distinct oblique postmedial transverse line in the hindwing. One female is externally different from the others. It is larger, with distinct discal dots in both pairs of wings and a dark basal area in the forewing. The holotype of this Afghanian subspecies is deposited in the collection Vartian (Vienna) and, unfortunately, we did not have a chance to study it. We have not seen current material of *E. convallata terricolor* from Afghanistan.

### *Eupithecia xanthomixta* Vojnits, 1988

**Fig 9, 10**

*Eupithecia xanthomixta* Vojnits, 1988: Acta Zoologica Hungarica **34** (4): 428, pl. 2, figs 11, 12; text-figs 21–24. Holotype ♂ (coll. Vartian, Vienna), Afghanistan (east): Khinju, Salang Pass, 2100 m.

**Material.** Paratypes: 1♂, **Afghanistan**, Khurd-Kabul SE v. Kabul, 1900 m, 26.vi.1965, Kasy & Vartian, Vojnits slide no. 15623♂; 1♀, same locality, 19.vi.1969, leg. Vartian, Vojnits slide no. 15682♀ (HNHM); 3♂, same data, G. Ebert leg., Vojnits slides nos 16967♂, 16968♂, 19530♂; 1♀, same locality, 3.vii.1965, Kasy & Vartian (SMNK); 1♀, E Afghanistan, s. v. Khinjan, Salang Pass, N-Seite, 2100 m, 9.vii.1969, leg. Vartian, Vojnits slide no. 15150♀ (HNHM). 1♂, 2♀, same locality, 5–11.vii.1966, G. Ebert leg., Vojnits slides nos 19529♂, 17870♀, 17871♀; 1♂, Salang-Nord, 2100 m, vic. Khindjan, 13.vi.1970, leg. C. Naumann, Nr. 1067 (SMNK).

A dark, motley, originally coloured and variable species from the *graphata* group which was described on the basis of a relatively large series of specimens. The male and female genitalia were briefly described and badly illustrated (especially the phallus and female genitalia) in Vojnits (1988).

***Eupithecia naumanni* Mironov & Ratzel, sp. n.**

**Figs 11, 12, 19, 25**

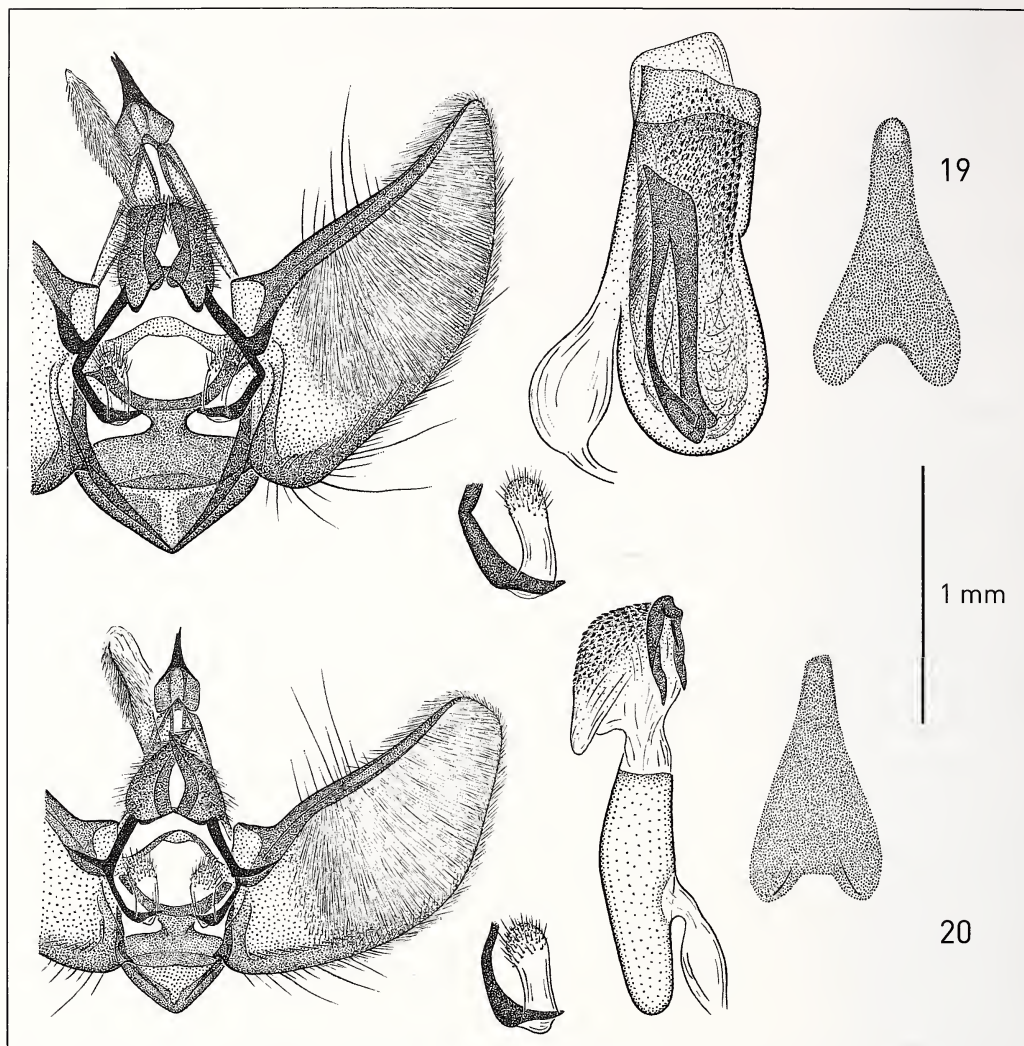
**Material.** Holotype ♀, E **Afghanistan**, Nuristan, Bashgal, vic. Barg-e-Matal, 3 km W (Seidental), 2500 m, 6.vii.1970, leg. C. Naumann, Nr. 1106, Ratzel slide no. GU8408/1w (SMNK). – Paratypes: 6♀, same data, Ratzel slide no. GU8408/2w; 1♀, same locality, Dandizenor, 3000 m, 13.vii.1970, Nr. 1122, leg. C. Naumann (SMNK); 2♂, 12♀, same locality, 2200 m, 3–5., 16.vii.1970, Nr. 11 and 1125, leg. C. Naumann E-lep 209, Ratzel slide no. GU9408/6w (SMNK, 4♀ in ZISP); 1♀, Badakhshan, 3500 m, Bala-Kuran loc., 10.vii.2003, local collector leg., Mironov slide no. 863♀ (coll. Skou).

**Description.** Wingspan 20.5–25.0 mm; length of forewing 11.5–13.5 mm. Labial palpi short and obtuse, length about one half of diameter of eye, covered with light brown scales with grey tips. Frons and vertex covered with mixture of brown and light grey scales. Notum and abdomen with dominant ash grey scales. Forewing rather elongate, with straight costal margin curving near apex, oblique termen and pointed apex; ground colour brownish grey; transverse lines brown; basal and antemedial oblique, sharply angled onto costa; medial line usually oblique, touching discal dot and sharply or right angled from discal dot onto costa; medial area between antemedial and medial lines usually darker than the rest of the wing; postmedial line slightly wavy, evenly curved onto costa; terminal area often darker, especially in apical part; discal dot relatively small, black, rounded or slightly elongated. Hindwing ovoid, similar in colour, transverse lines distinct only along anal margin; terminal area usually slightly darker, with wavy inner border and a series of dark dashes on the veins; discal dot paler, brownish, rounded or slightly elongated and more or less distinct; fringe on all wings chequered pale grey and brownish grey.

**Male genitalia** (Fig. 19). Uncus medium-sized, rather narrow, biapical. Valve shaped like a segment of orange fruit; dorsal margin slightly arched near base; ventral margin parallel to dorsal at basal half and evenly curved and tapering to apex; apex narrowly rounded; sacculus lightly sclerotized. Vinculum rather narrow and short, tapering anteriorly. Papillae on the anterior arms of the labides medium length and width, slightly curved, covered with short setae at apices. Phallus stout, large and broad, shorter than length of valve. Vesica covered with numerous denticules, larger on one side and armed with a long and narrow, V-shaped, plate-like cornutus typical for the males of the “*graphata*” species-group. Sternite A8 peg-like, elongated, with stronger sclerotized margins near apex; basal emargination relatively broad and deep.

**Female genitalia** (Fig. 25). Bursa copulatrix large, ovoid-oblong, membranous, about one half covered with slim spines, which are larger posteriorly; the border of





**Figs 19–20.** Male genitalia of *Eupithecia* species (scale bar = 1 mm: with sternite A8, and papillae on the anterior arms of labides enlarged). 19. *E. naumanni* Mironov & Ratzel, sp. n. 20. *E. ochrovittata* Christoph, 1887.

spiniferous area oblique. Ductus bursae tapering to colliculum, heavily sclerotized, with distinct oblique border from corpus bursae and chain of small spines along this border between base of ductus bursae and colliculum. Ductus seminalis broadened in basal part; attached to the middle of corpus bursae at right side. Colliculum collar-like, rather medium-sized, slightly elongated and inclined to one side. Antrum short and broad, membranous. Tergite A8 rectangular, broader than long, with rounded posterior corners. Anterior and posterior apophyses medium length and thickness, tapering to apices. Papillae anales relatively large, broad, rounded, covered with short setae.

**Diagnosis.** This species belongs to the *graphata* group. It is similar to *E. xanthomixta* Vojnits, 1988, but the new species is usually larger, ground colour pale greyish brown,

wing pattern less distinct, postmedial transverse line more evenly curved near costa and not bordered by blackish shading, hindwing darker with indistinct transverse lines. The male and female genitalia are very similar to those of *E. xanthomixta*. The male genitalia can be distinguished by the larger valva with more arched dorsal margin and broader apex than in *E. xanthomixta*. The female genitalia of these two species appear identical.

**Distribution.** East Afghanistan.

**Etymology.** This species is named in honour of the German zoologist and lepidopterologist Prof. Dr. Clas Naumann (1939–2004), the former Director of the “Zoologisches Forschungsinstitut und Museum Alexander Koenig”, Bonn, Germany (ZFMK). Many times he visited Afghanistan and collected most part of the type series of this new species *Eupithecia naumanni*.

**Remarks.** Unfortunately, the majority of paratypes of this species are very worn. We believe that the *graphata* group includes mainly recently-diverged species because the male and female genitalia of many species in this group are very similar. Some species of the *graphata* group can be distinguished from each other by external features only, such as ground colour and wing pattern (Schütze 1958).

### *Eupithecia simpliciatata* (Haworth, 1809)

*Phalaena simpliciatata* Haworth, 1809: Lepidoptera Britannica (2): 359. Syntype(s) (BMNH ?), [Great Britain].

[*Geometra*] *subnotata* Hübner, 1813: Sammlung Europäischer Schmetterlinge 5 Geometrae (2), pl. 89, fig. 458. Syntype(s) lost, [Europe] (synonymised in Herrich-Schäffer 1848; as *Eupithecia subnotataria* [sic] (Hübner, 1813).

*Eupithecia subnotata* f. *collustrata* Dietze, 1911: Biologie der Eupitheciiden 1: pl. 85, fig. 947; ibidem (1913) 2: 107. Syntypes 2♂, 3♀ (coll. K. Dietze in MNHU), [Kyrgyzstan]: Karagai-tau; Naryn; [China]: Altyn-dagh.

Misidentification: *Eupithecia inculta*: sensu Viidalepp 1988 (nec Vojnits 1975).

**Material.** Syntype of *Eupithecia subnotata* f. *collustrata*: 1♀, **Kyrgyzstan**, Karagai tau, *subnotata* v. *collustrata* v. *issyka* Bang-Hs., Karagai tau (coll. K. Dietze in MNHU). **Afghanistan**: 1♂, Nuristan, 25 km N. v. Barikot, 1800 m, 12–17.vii.1963, Kasy & Vartian (HNHM); 2♂, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 24.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 262 (SMNK).

This is a widespread species, ranging from Western Europe to northwestern China (Xinjiang) from close to sea level to about 3300–3400 m above sea-level in Tajikistan (Viidalepp 1988, as *E. inculta*) and Afghanistan from where it was not hitherto known until now.

**Remarks.** The widely used names for this species (*E. simpliciatata* and *E. subnotata*) were used as two bona species in “Geometrid Moths of the World: A catalogue (Lepidoptera, Geometridae)” by Scoble et al. (1999) despite the very old synonymisation of these taxa by Herrich-Schäffer (1848).

### *Eupithecia centaureata* (Denis & Schiffermüller, 1775)

*Geometra centaureata* Denis & Schiffermüller, 1775: Systematisches Verzeichnis Schmetterlinge, Wien: 114. Syntype(s) lost, [Austria]: Vienna district.

*Eupithecia oblongata* var. *centralisata* Staudinger, 1892: Deutsche entomologische Zeitschrift, Iris 5 (1): 250. Syntypes 13, at least 5♂, 6♀ (coll. O. Staudinger in MNHU), Central Asia: [Uzbekistan]: Margelan; Namangan; Samarkand; [Kyrgyzstan]: Alexander Mts.; [Kazakhstan]: Saisan.

*Eup[ithecia] oblongata* f. *obscura* Dietze, 1910: Biologie der Eupitheciiden 1: pl. 70, fig. 132; ibidem (1913), 2: 63. Syntypes 6, at least 4♀ (coll. K. Dietze in MNHU), [Kyrgyzstan]: Alai Mts.; [Kazakhstan]: Uralsk; [Italy]: southern Tyrol.

*Eupithecia centaureata dagestani* Vojnits, 1977: Acta Zoologica Academiae Scientiarum Hungaricae 23 (1–2): 229, fig. 2. Holotype ♂ (ZFMK), [Russia]: Dag(h)estan, Petrovsk-port [= Makhachkala].

*Eupithecia centaureata dsharkendi* Vojnits, 1977: Acta Zoologica Academiae Scientiarum Hungaricae 23 (1–2): 230, fig. 3. Holotype ♀ (ZFMK), [Kazakhstan]: Dsharkend, Semiretschensk.

*Eupithecia chinae* Vojnits, 1977: Acta Zoologica Academiae Scientiarum Hungaricae 23 (1–2): 231, figs 4, 5b.

Holotype ♂ (ZFMK, now in HNHM), China: Shantung Province, Tai-shan, 1550 m (synonymised in Mironov & Galsworthy 2007).

**Material.** Syntypes of *E. centaureata* f. *obscura*: 1♀, **Kyrgyzstan**, *oblongata* forma: *obscura* typ, Alai mont.; 1♀, Alai mont. 1905 Korb, 25.vii.1905, *oblongata* ab. *obscur.* Dietze (coll. K. Dietze in MNHU). – Holotype of *E. centaureata dagestani* ♂, **Russia**, Dagestan, Petrovsk-port, 29.v.1926, M. Rjabov, Vojnits slide no. 743♂ (ZFMK). – Holotype of *E. centaureata dsharkendi* ♀, **Kazakhstan**, Dsharkend, Semiretschensk, Vojnits slide no. 1110♀ (ZFMK). – Holotype of *E. chinae* ♂, **China**, Tai-shan (1550 m), Prov. Shantung, 16.viii.1934, H. Höne, Vojnits slide no. 1103♂ (ZFMK). – Paratypes of *E. chinae*: 1♀, same locality, 11.viii.1934, H. Höne, De Laever slide no. 424♀; 1♀, Harbin, (Manchuria), Juni 1923, V. Tolmachov, Vojnits slide no. 1101♀ (HNHM). **E Afghanistan**: 1♀, Nurisan-Bashgal, vic. Barg-e-Matal, 2200 m, Flussaue, 16.vii.1970, Nr. 1125, leg. C. Naumann, E-lep 209; 1♂, NE Afghanistan, Prov. Badakhshan, 1750 m, 12 km NE of Baharak, Pejuj, 27.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 224; 1♂, same locality, 3000 m, 15 km NE of Baharak, Kotal-e-Zardeu, 30.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 230 (SMNK).

This is one of the most easily recognizable species among the Palaearctic representatives of the genus. The male and female genitalia were described and illustrated in Petersen (1910) for the first time and in many other publications later.

*E. centaureata* is a widespread and relatively common species, it ranges from the Atlantic coast of Ireland, Portugal, and Morocco across Europe and the greater part of Asia to the Far East of Russia (Priamurje) and the Pacific coast of the Chinese province Guangdong, as well as Taiwan. It had not been recorded for the fauna of Afghanistan until now.

### *Eupithecia nachadira* Brandt, 1941

**Fig. 13**

*Eupithecia nachadira* Brandt, 1941: Mitteilungen der Münchner entomologischen Gesellschaft 31 (3): 877, pl. 29, fig. 23. Lectotype ♂ (designated in Mironov 2003; NHRS), [Iran]: Kouh i Taftan, 2500–2800 m.

**Material.** Lectotype ♂, **Iran**, Baloutchistan, Kouh i Taftan (Khach), 2800 m, 30 Mai 1938, Coll. Brandt, 32/88, Riksmuseum Stockholm, Mironov slide no. 869♂, Illustrated in GME vol. 4, Mironov: Larentiinae II (NHRS). – Paralectotypes: 3♂, 1♀, same data, Schmidt slide no. Eu 133♀ (in ZFMK), Vojnits slides nos. 625♂, 637♂ (in HNHM), Mironov slide no. 871♂ (in NHRS) (NHRS); 1♀, same locality, 1 Juni 1938, Coll. Brandt, 35, *E. nachadira* Brdt.; 1♂, same locality, 2500 m, 30 Apr. 1938, Coll. Brandt, 94/57, *nachadira* Brdt., 34, photo 25 F 80 det. A. Vojnits [without abdomen] (NHRS); 1♂, same locality, 12 Mai 1938, Coll. Brandt, 43c, *Eupithecia nachadira* Brandt, det. D. S. Fletcher, see W.B. XII list, L.B. Prout Coll., B.M. 1939–643 (BMNH). **C Afghanistan**: 7♀, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slides nos 17776♀, 17777♀, 17778♀, 17781♀, 17782♀, 17783♀, 19555♀ (SMNK).

*E. nachadira* was described and hitherto only recorded from Iran. It belongs to the *centaureata* group and was not previously recorded from Afghanistan. The male genitalia were described and illustrated in Mironov (2003) for the first time.

**Remarks.** The type specimens of *E. nachadira* were not designated by Brandt with labels “holotype” and “paratype”. In addition, all syntypes mentioned above are without abdomens and only two have information about genitalia slides made by Vojnits.



***Eupithecia repetita* Vojnits, 1981**

*Eupithecia repetita* Vojnits, 1981: Annales Historico-Naturales Musei Nationalis Hungarici 73: 225, figs 7, 8. Holotype ♂ (SMNK), Pakistan (west): Swat, Kalam, 2000 m.

**Material.** Holotype ♂, W **Pakistan**, Swat, Kalam, 2000 m, 9.vii.1969, leg. G. Ebert, Vojnits slide no. 12105♂ (SMNK). – Paratypes: 1♂, 2♀, same data, Vojnits slides nos 12114♂, 12107♀, 12118♀ (SMNK); 1♂, 1♀, same data, Vojnits slides nos 12116♂, 12109♀ (HNHM); 1♂, 5♀, same locality, N. v. Kalam, Gabral-Tal, 2100 m, 6–9.vii.1969, leg. G. Ebert, Vojnits slides nos 12104♂, 12112♀, 12106♀, 12111♀, 12115♀, 12117♀ (SMNK). SE **Afghanistan**: 2♀, Safed Koh, S-Seite, Kotkai, 2350 m, 9.vii, 13.viii.1968, M. Müller leg., Vojnits slides nos 19554♀, 16954♀ (SMNK).

It was not surprising that this species occurs in Afghanistan, because it was described from the western provinces of Pakistan. According to the structure of the male and female genitalia (Vojnits 1981), it is a representative of the *centaureata* group with striking external appearance. The holotype of *E. repetita* was illustrated by Mironov et al. (2008c) for the first time.

***Eupithecia subtilis* Dietze, 1910**

*Eupithecia* *staudingeri* f. *subtilis* Dietze, 1910: Biologie der Eupitheciiden 1: pl. 79, figs 870, 871; pl. 80, fig. 900. Lectotype ♀ (designated in Mironov et al. 2008c, coll. K. Dietze in MNHU), Hyrcan(ia) [Iran]: Schahkuh.

*Eupithecia tonu* Viidalepp, 1988: Fauna pyadenits gor Srednej Azii [Geometridae fauna of the Central Asian mountains]: 118, pl. 2, fig. 16; text-pl. 26, fig. 1. Holotype ♀ (IAET), Tadzh. SSR [Tajikistan]: South-western Alai, Dzhirgatal, 1700 m (synonymised in Mironov et al. 2008c).

**Material.** Lectotype ♀, **Iran**, *subtilis* Dietze ?*staudingeri*-Form., Schahkuh Typ., 105., n. spec. ♀, cf. Dietze Iris 19. T. 1, Iris XIX, Taf. 1, fig. 15, durch Petersen (coll. Dietze in MNHU). – Paratypes of *E. tonu* [*toenui* on the label]. 1♀, **Uzbekistan**, Usbeki NSU, Tšimgan, 29.vi.1981 (IAET). 1♂ (*nec* ♀), **Tajikistan**, Ferghana, Schakhimardan, 1550 m, 17.vii.1952, Bundel, 29. 1♀, **Kyrgyzstan**, Alajsky Mts., northern slope, vic. Sufi-Kurgan, Terek, 2300 m, 15.vii.1968, Bundel, 60, Viidalepp slide no. 2362♀, ZISP microprep. № 17091 (ZISP). **Afghanistan**: 1♀, Paghman, 30 km NW v. Kabul, 2100 m, 20–30.vii.1962, E. & A. Vartian leg., Vojnits slide no. 17428♀; 1♀, same locality, 2200 m, 29.vi–8.vii.1963, Kasy & Vartian, Vojnits slide no. 17387♀ (HNHM); 3♀, C Afghanistan, Koh-i-Baba, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slides nos 19547♀, 19548♀, 19550♀; 1♀, E Afghanistan, Nurisan-Bashgal, vic. Barg-e-Matal, 2200 m, prep. Ratzel 2008, E-lep 209 (SMNK).

This is a representative of the *centaureata* species-group. *E. subtilis* is known from Iran, Uzbekistan, Kyrgyzstan, Tajikistan, and Pakistan. It occurs in from about 1500 m up to about 3500 m above sea-level. A new species for the fauna of Afghanistan. The female genitalia were described and illustrated in Viidalepp (1988) as *E. tonu*. The male genitalia of *E. subtilis* will be described in our forthcoming paper treating material from Tajikistan and Iran.

***Eupithecia egregiata* Mironov & Ratzel, 2008**

*Eupithecia egregiata* Mironov & Ratzel, 2008: Transactions of the Lepidopterological Society of Japan 59 (3): 214, figs 10, 18, 22. Holotype ♂ (HNHM), Pakistan (north-west): Prov. Swat, Gabral-Tal, 15 km northern Kalam, 2100 m.

**Material.** Holotype ♂, NW **Pakistan**, Prov. Swat, Gabral-Tal, 15 km N of Kalam, 2100 m, 6–9.vii.1969, leg. Vartian, Vojnits slide no. 15674♂ (HNHM). – Paratypes: 1♀, same data, Vojnits slide no. 15132♀; 1♀, same data, but leg. G. Ebert, Vojnits slide no. 12108♀ (HNHM); 1♀, Great West. Himalaya Mts., near Gabar, 3200 m, 21–24.viii.2004, leg. V. Gurko, Ratzel slide no. GU1905/5w (coll. Ratzel). SE **Afghanistan**: 1♀, Safed Koh, S-Seite, Kotkai, 2350 m, 25.vii.1968, M. Müller leg., Vojnits slide no. 19368♀ (HNHM).

This species from the *centaureata* group was described on the base of a small series of specimens (one male holotype and four female paratypes) from Pakistan and Afghanistan (one female). We have not seen additional material of this species from Afghanistan.

### *Eupithecia decipiens* Petersen, 1910

Fig. 14

*Eupithecia* *decipiens* Petersen, 1910: Deutsche entomologische Zeitschrift, Iris **22** (4): 279, pl. 26, fig. 104. Syntypes ♂, ♀ (coll. K. Dietze in MNHU), [Iran]: Schahkuh.

**Material.** Syntype 1 ex. [without antennae and abdomen]: **Iran**, *decipiens* Peters., Schahkuh. Typ., K. Dietze, *decipiens*, Zool. Mus. Berlin (coll. K. Dietze in MNHU). **C Afghanistan:** 1♂, Koh-i-Baba, N-Seite, Band-i-Amir, 2900 m, 24–26.vii.1966, G. Ebert leg., Vojnits slide no. 19531♂ (SMNK).

*E. decipiens* is a little-known and rare Asian species which was described from northern Iran and previously known only from Iran, Uzbekistan (coll. IAET), and Kyrgyzstan (Viidalepp 1988), occurring from about 1500 m up to about 2900 m above sea-level. This is a new species for the fauna of Afghanistan.

This species is unlikely to be confused with any other Asian representative of the genus. The triangular forewings with almost straight margins, narrow apex and distinctive dark, oblique, narrow medial band between antemedial and medial transverse lines, which is sharply angled from R vein onto costa, make this an easy species to identify. According to the structure of the male and female genitalia this species belongs to the *centaureata* group. The details of the male and female genitalia were described and illustrated in Petersen (1910).

### *Eupithecia mekrana* Brandt, 1941

*Eupithecia mekrana* Brandt, 1941: Mitteilungen der Münchner entomologischen Gesellschaft **31** (3): 877, pl. 29, fig. 24. Lectotype ♂ (designated in Mironov 2003, NHRS), [Iran]: Baloutchistan, Bender Tchahbahar.

*Eupithecia mekrana khorassana* Brandt, 1941: Mitteilungen der Münchner entomologischen Gesellschaft **31** (3): 877. Lectotype ♂ (designated in Mironov 2003, NHRS), [Iran]: Khorassan, Kouh i Binaloud (Meched), 2500 m.

*Eupithecia idonea* Vojnits, 1982: Acta Zoologica Academiae Scientiarum Hungaricae **28** (3–4): 412, figs 12, 13. Holotype ♂ (HNHM), Armenia: Migry near Araks (synonymised in Mironov 1991).

*Eupithecia stulta* Vojnits, 1982: Acta Zoologica Academiae Scientiarum Hungaricae **28** (3–4): 413, fig. 14. Holotype ♂ (HNHM), Armen(ia): St(ation) Negram near Araks (synonymised in Mironov 1991).

*Eupithecia commenticia* Vojnits, 1982: Acta Zoologica Academiae Scientiarum Hungaricae **28** (3–4): 414, figs 15, 17. Holotype ♂ (HNHM), Armenia: Migry near Araks (synonymised in Mironov 1991).

*Eupithecia mekrana amiralis* Wiltshire, 1986: in Büttiker & Krupp, Fauna of Saudi Arabia **8**: 280, fig. 102, gen. figs 18, 19. Holotype ♂ (BMNH), [Saudi Arabia]: UAE (“Trucial Oman”), Masafi.

**Material.** Lectotype ♂, **Iran**, Baloutchistan, Bender Tchahbahar, 3 Februar 1938, Coll. Brandt, 82/57, *graciliata* Dtze., *mekrana* Brdt., 30/88, Riksmuseum Stockholm, Mironov slide no. 867♂ (NHRS). – Paralectotypes: 1♂, same locality, 22 Januar 1938, Coll. Brandt, *graciliata* Dtze., 29/88, Riksmuseum Stockholm, Mironov slide no. 868♂ (NHRS); 2♂, same locality, 24 Januar 1938, Coll. Brandt, *graciliata* Dtze., 42 and 16, photo 24 F 80 det. A. Vojnits (both specimens without abdomens, NHRS); 1♂, same locality, Januar 1938, Coll. Brandt, *Eupithecia graciliata* Dietze ♂?, W.B. XI 33A, Preparation W.B. M. 416 (BMNH). – Lectotype of *E. mekrana khorassana* ♂, **Iran**, Khorassan, Kouh i Binaloud (Meched), 2500 m, 5 Aug. 1938, Coll. Brandt (NHRS). – Paralectotype of *E. mekrana khorassana*: 1♀, same data, Coll. Brandt, 40, 25 (NHRS). – Holotype of *E. idonea* ♂, **Armenia**, Megry na Araxe, Rjabov, 29.viii.1932, 39/77, Vojnits slide no. 13656♂ (HNHM). – Paratype of *E. idonea*: 1♀, **Armenia**, Transkauk., fl. Arax, st. Darasham I, 25.viii.932, Rjabov, 39/70, Vojnits slide no. 13663♀ (HNHM). – Holotype of *E. stulta* ♂, **Armenia**, St. Negram na Araxe, Rjabov, 19.v.1934, 39/81, Vojnits slide no. 13657♂ (HNHM). – Holotype

of *E. commenticia* ♂, **Armenia**, Megry na Araxe, Rjabov, 29.viii.1932, 39/74, Vojnits slide no. 13655♂ (HNHM). – Paratype of *E. commenticia*: 1♀, **Armenia**, Russ. Armen., Migry, M. Rjabov, 29.viii.1932, 39/68, Vojnits slide no. 13650♀ (HNHM). – Paratype of *E. mekrana amiralis*: 1♀, Trucial **Oman**, Masafi, 22–24.ii.1971, M. D. Gallagher, *Eupithecia mekrana* Brdt. *amiralis* Wts. paratype ♀, Paratype, Brit. Mus. 1971–158 (BMNH). E **Afghanistan**: 2♂, 3♀, Sarobi, 1100 m, 25.iv, 7, 10, 10, 11.x.1961, leg. G. Ebert, Ratzel slides nos GU12208/1w, GU12208/2w, GU9208/5m (SMNK).

This small yellowish or pale ochreous species is distributed from steppen chalk hills in Orenburg province in the southeastern European Russia in the north (Mironov 2003) to Saudi Arabia in the south (Wiltshire 1986). It is known also in the eastern provinces of Turkey, in Armenia, Azerbaijan, and Iran. A new species for the fauna of Afghanistan. The male and female genitalia were described and illustrated by Vojnits (1982a) under names *E. idonea*, *E. stulta*, and *E. commenticia* – three synonyms of the same species in one publication.

**Remarks.** The full type series of this species was not marked by Brandt with original labels “holotype”, “paratype” or “syntype”. There are additional labels only with inscription “mekrana” by pencil.

### *Eupithecia variostrigata* Alphéraky, 1876

*Eupithecia variostrigata* Alphéraky, 1876: Horae Societatis entomologicae Rossicae 10: 40. Holotype ♂ (not traced), Russia: Taganrog.

*Eupithecia albosparsata* Joannis, 1891: Bulletin de la Société entomologique de France 6: 81. Syntypes 2, including ♂ (MNHN), Turkey: Césarée (synonymised in Mironov 2003).

[*Eupithecia*] *variostrigata* f. *designata* Dietze, 1913: Biologie der Eupitheciiden 2: 49; ibidem (1910), 1: taf. 73, figs 339, 340 (without name of form). Syntypes, including ♂ (coll. K. Dietze in MNHU), Caucasus [Azerbaijan]: Ordubad.

Incorrect subsequent spelling: *artemesiata*: Scoble & al. (1999).

**Material.** Syntypes of *E. albosparsata*: 1♂, **Turkey**, Césarée, *albosparsata* L. de Joannis, Syntype, *variostrigata* Alph. (t-Halict.), 1920–1932 coll. L. & J. De Joannis, Muséum Paris, Fig. par J. Culot, Noct. et Géom. d'Europe, Pl. 41, fig. 849, P. Leraut det. prép. n° 11850, *Eupithecia albosparsata* ♂; 1♂?, Césarée, *Eupithecia albosparsata* De Joannis, 1891, Syntype, 1920–1932 coll. L. & J. De Joannis, Muséum Paris (MNHN). E **Afghanistan**: 1♂, Nurisan-Bashgal, vic. Barg-e-Matal, 2000 m, 21 km S, 25.x.1970, Nr. 1144, leg. C. Naumann E-lep 209, prep. Ratzel 2008 (SMNK).

A new species for the fauna of Afghanistan. It is a widespread western Palaearctic species occurring from Spain in the west to western Pamirs in the east. The holotype of *E. variostrigata*, which was illustrated by Dietze (1906, 1910), could not be found in any of the studied museum collections.

### *Eupithecia subpulchrata* Alphéraky, 1883

**Fig. 15**

*Eupithecia subpulchrata* Alphéraky, 1883: Horae Societatis entomologicae Rossicae 17 (3/4): 221, pl. 8, fig. 75. Holotype ♂ (not traced), [China]: Ili (region), Kouldjà [= Kuldja] [Yining (Gulja)].

**Material.** **Afghanistan**: 1♀, Salang-Pass, N-Seite, (Khinjan), 2100 m, 5–11.vii.1966, G. Ebert leg., Vojnits slide no. 19553♀; 1♀, NE Afghanistan, Prov. Badakhshan, 1750 m, 12 km NE of Baharak: Pejúj, 27.vi.1971, UV-Li, Ebert & Naumann, coll. Nr. 224, Ratzel slide no. GU25408/1w (SMNK).

This handsome species from the *gueneata* group was described on the basis of a single male specimen from northwestern China. It was also known from Turkmenistan, Uzbekistan, and southern Kazakhstan. Not previously recorded from Afghanistan. The details of the male genitalia were described and illustrated by Petersen (1910) for the



first time on the basis of one specimen from the Dietze collection. Habitus of the type specimen of *E. subpulchrata* from Saint-Petersburg Museum was illustrated by Dietze (1906, 1910). However, Alphéraky's type was not found in the Dietze collection in MNHU nor some other European museums, such as ZISP and BMNH. The details of the bursa copulatrix were described and illustrated in Viidalepp (1988) from a specimen from southern Kazakhstan.

### *Eupithecia vulgata* (Haworth, 1809)

*Phalaena vulgata* Haworth, 1809: Lepidoptera Britannica (2): 359. Syntype(s) (BMNH), [Great Britain]. *Eupithecia lepsaria* Staudinger, 1882: Stettiner Entomologische Zeitschrift 43 (1–3): 74. Syntypes 2♂ (coll. O. Staudinger in MNHU), [Kazakhstan]: *Lepsa* (treated as subsp. of *Eupithecia vulgata* in Mironov 1989a).

**Material.** Syntypes of *E. lepsaria*: 1♂, **Kazakhstan**, Lepsa Hbhr., *lepsaria* ♂, Origin., Gen. vérifiés 1454/1 *Eupithecia lepsaria* Stgr. ♂, Lepsa, dét. E. De Laever 1954 (coll. O. Staudinger in MNHU); 1♂, *lepsaria* ♂ Lepsa, Origin., bon. sp. bei *Vulgata* nicht *gueneata* (Boh.), Vojnits slide no. 19034♂ (coll. O. Staudinger in MNHU). **Afghanistan**: 4 exx., Paghman, 30 km NW v. Kabul, 2500 m, 29.vi–8.vii.1963, 20. u 28.vi.1965, 5.vii.1965, Kasy & Vartian (HNHM); 8♂, 1♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 14–23.vi.1966, 21.vi–1.vii.1969, G. Ebert leg., Vojnits slides nos 17554♂, 17555♂, 17556♂, 17557♂, 17558♂, 19528♂, 19538♂, 19539♂, 19525♀ (SMNK); 4 exx., same locality, 21.vi–1.vii.1969, leg. Vartian (HNHM); 1♂, same locality, 4.vii.1967, M. Müller leg.; 1♀, 3 exx. (all destroyed), E Afghanistan, Prov. Bamian, vic. Panjao, 2300 m, 27.vi.1970, Nr. 1083, leg. C. Naumann E-lep 209, prep. Ratzel, Ratzel slide no. GU24408/3w; 1♀, NE Afghanistan, Wakhan-Tal, 3300 m, Zemestani Baharak, 10.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242 (SMNK).

This is a widespread and common Palaearctic species ranging from the Atlantic coast of Ireland and Portugal in the west across Europe, Mid-East and Central Asia to the Far East of Russia (Priamurje) and Korea in the east. Not hitherto known from Afghanistan.

The specimens from Central Asia externally do not differ from European specimens except that they are usually darker, blackish grey or brown coloured. Both male and female genitalia of adults from Afghanistan and adjacent areas are very similar to those from European specimens. The details of the male and female genitalia were described and illustrated in Petersen (1910) for the first time and after that in many other publications of European authors.

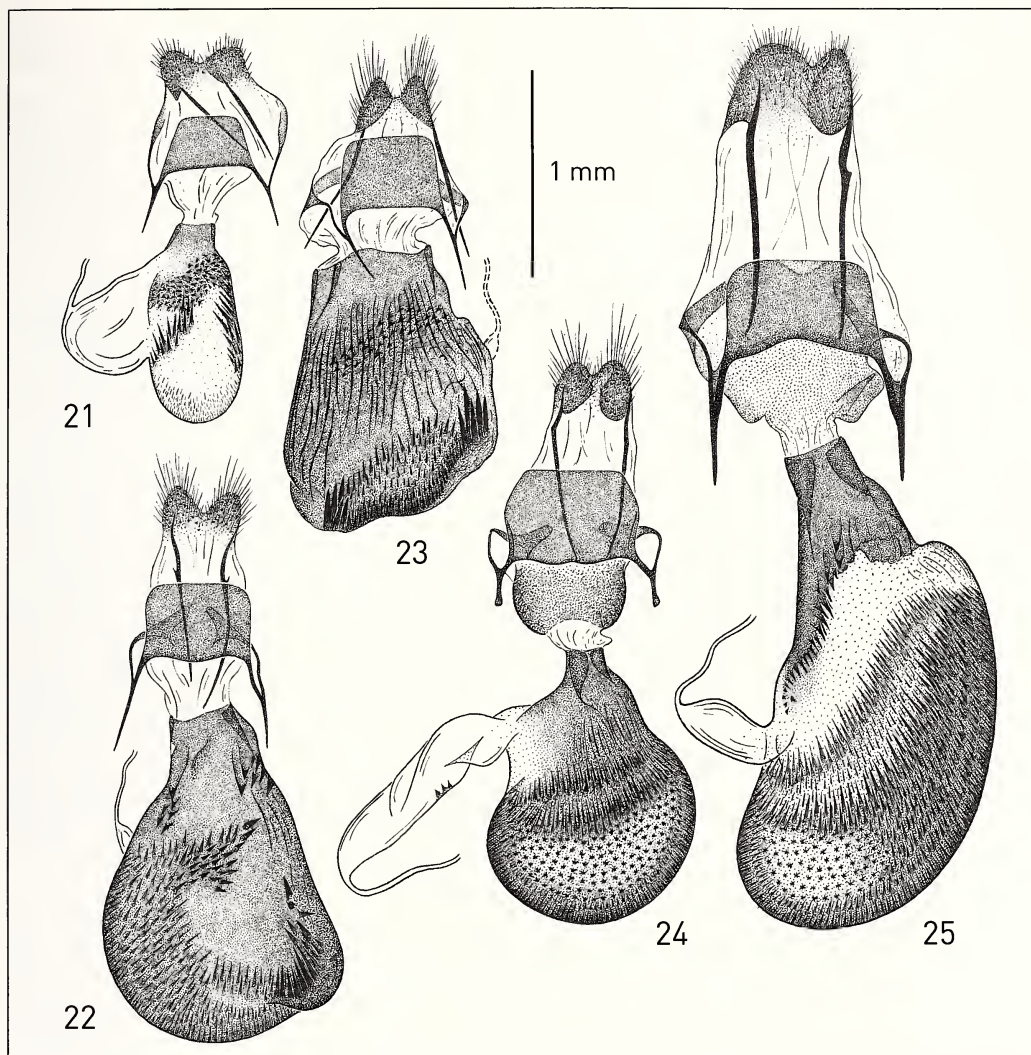
### *Eupithecia ochrovittata* Christoph, 1887

**Figs 16, 20**

*Eupithecia ochrovittata* Christoph, 1887: in N. M. Romanoff, Mémoires sur les Lépidoptères 3: 7, pl. 1, fig. 3. Lectotype ♀, herewith designated to stabilize nomenclature (ZISP), [Armenia]: Erivan.

**Material.** Lectotype (abdomen lost) ♀, **Armenia**, Erivan ♀, 12.vii.1881 Chr., 16, Coll. Vel. Knjazja Nikolaja Mikhailovicha, Lectotypus ♀ *Eupithecia ochrovittata* Christoph, 1887, design. V.G. Mironov, 2011 (ZISP). **E Afghanistan**: 1♂, Pol-i-Charchi, 18 km E of Kabul, 1700 m, 25.vi–3.vii.1966, H. G. Amsel leg., Vojnits slide no. 19551♂ (SMNK).

This rare species of *Eupithecia* was previously only recorded from Transcaucasus (Georgia and Armenia). The finding of *E. ochrovittata* in Afghanistan was quite unexpected. The single Afghanian specimen is smaller (wingspan 17.5 mm) than the transcaucasian specimens. It is worn but with visible distinctive dark costal margins, distinct small discal dots and the rest of the surface colour in the forewings, as well as with pale, dirty white hindwings. The type specimen of this species was figured in the third volume of Romanoff's series of book (1887) and afterwards illustrated by Dietze (1906, 1910)



**Figs 21–25.** Female genitalia of *Eupithecia* species (scale bar = 1 mm). 21. *E. tabestana* Mironov & Ratzel, sp. n. 22. *E. obtinens* Brandt, 1941. 23. *E. fredii* Mironov & Ratzel, sp. n. 24. *E. incurvaria* Hampson, 1903. 25. *E. naumanni* Mironov & Ratzel, sp. n.

as well. The male of *E. ochrovittata* was previously unknown. We therefore include a description and illustration of the male genitalia.

**Male genitalia** (Fig. 20). Uncus relatively small, short and narrow, biapical. Valva shaped like a lemon segment slightly arched near base of dorsal margin, with evenly curved ventral margin and broadly rounded, rather obtuse apex; sacculus slightly sclerotized. Vinculum short and narrow, tapering anteriorly. Papillae on the anterior arms of the labides medium-sized, covered with short setae at apices. Phallus slim, short and narrow, narrowing anteriorly, shorter than valval length. Vesica covered with numerous denticules and armed with one horse-shoe-shaped cornutus. Sternite A8 peg-like, evenly tapered to apex and sclerotized near it; basal emargination relatively shallow.



***Eupithecia exactata* Staudinger, 1882**

*Eupithecia exactata* Staudinger, 1882: Entomologische Zeitschrift, Stettin **43** (1–3): 78. Syntypes 1♂, 2♀ (coll. O. Staudinger in MNHU), [Kazakhstan]: Saisan.

*Eupithecia exactata* f. *modesta* Dietze, 1910: Biologie der Eupitheciën **1**, pl. 73, fig. 380. Holotype ♂ (coll. K. Dietze in MNHU), [China]: Aksu, Makan-Wüste [Korla, Sai-chin on the label].

*Eupithecia procera* Vojnits, 1982: Acta Zoologica Academiae Scientiarum Hungaricae **28** (3–4): 418, fig. 20. Holotype ♂ (HNHM), East Turkestan [Kyrgyzstan]: Prov. Semirechgensee, Fort-Naryne. **Syn. n.**

*Eupithecia opulenta* Vojnits, 1982: Acta Zoologica Academiae Scientiarum Hungaricae **28** (3–4): 420, fig. 21. Holotype ♀ (HNHM), East Turkestan [Kyrgyzstan]: Prov. Semirechgensee, Fort-Naryne (synonymised in Mironov 1991).

*Eupithecia subolivacea* Inoue, 1996: Transactions of the Lepidopterological Society of Japan **47** (4): 241, figs 7, 14. Holotype ♀ (coll. H. Inoue in BMNH), Pakistan: Gilgit (synonymised in Mironov et al. 2008b).

**Material.** Syntypes: 1♂, **Kazakhstan**, *exactata* ♂ Saisan, Origin., Gen. vérifiés 1456/1 *Eupithecia exactata* Stgr. ♂, Saisan, dét. E. De Laever 1954 (coll. O. Staudinger in MNHU); 1♀, Saisan, Origin., gehört ui den Nähe der *Gratiosata* HS. Boh., *exactata* Stgr. det. E. Schütze, Kassel (coll. O. Staudinger in MNHU); 1♀, Saisan Hbhr., Origin., *Exactata* Stgr ♀, Boh. Schakuh, *exactata* Stgr. det. E. Schütze, Kassel (coll. O. Staudinger in MNHU). – Holotype of *E. exactata* f. *modesta* ♂, **China**, Korla, Sai-chin, ? *exactata* forma: *modesta* Typ., Korla. (380), Zool. Mus. Berlin, Typus *exactata* Stgr. det. E. Schütze, Kassel, Gen.-Unters. Nr. [Schmidt slide no.] Eu 113a, Zool. Mus. Berlin (coll. K. Dietze in MNHU). – Holotype of *E. procera* ♂, **Kyrgyzstan**, Turkestan Oriental, Fort Naryne, Prov. Semirechgensee, S. Akulin 1910–1911, Holotypus *Eupithecia procera* Vojnits, 1981, Gen. 892♂ det. Vojnits A. (HNHM). – Holotype of *E. opulenta* ♀, **Kyrgyzstan**, Turkestan Oriental, Fort Naryne, Prov. Semirechgensee, S. Akulin 1910–1911, Holotypus *Eupithecia opulenta* Vojnits, 1981, Gen. 891♀ det. Vojnits A. (HNHM). – Holotype of *E. subolivacea* ♀, **Pakistan**, Gilgit, Alt. 1600 m, 17.vii.1990, F. Aulombard et J. Plante leg., BM Geom. slide no. 19217 (coll. H. Inoue in BMNH). **NE Afghanistan**: 1♂, Badachschan, Anjuman Dorf, 3000 m, 20–27.vii.1961, Ratzel slide no. GU13312/2m; 1♂, Anjuran Pass, 3990–4300 m, 10.vii.1963, leg. K. Omoto; 1♀, Badakshan m., Bela Kuran, 2900 m, 12–29.vii.1961, leg. K. Omoto, Ratzel slide no. GU12312/2w (ZSM); 1♂, 2♀, Wakhan-Tal, 3300 m, Zamestani Baharak, 10.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242, Ratzel slide no. GU14208/1 (SMNK, coll. Ratzel); 1♀, same locality, 23.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 261, Ratzel slide no. GU9208/4w; 11♂, 7♀, same locality, Sargaz, 2930 m, 11.viii.1971, UV-Li, Ebert & Naumann, coll. Nr. 290 (SMNK); 3♂, 1♀, C Afghanistan, Koh-i-Baba, S-Seite, Panjao, 2650 m, 20–22.vii.1966, G. Ebert leg., Vojnits slides nos 17772♂, 17773♂, 19518♂, 17775♀ (SMNK)

This is a common Asian mountainous species, widespread in northern Iran (Shahkuh Mts.), Kyrgyzstan, Tajikistan, Pakistan/India (Jammu & Kashmir), southeastern regions of Kazakhstan, northwestern provinces of China (Xinjiang), and in Mongolia. Not previously recorded from Afghanistan. The male and female genitalia were described and illustrated in De Laever (1956) for the first time.

***Eupithecia nephelata* Staudinger, 1897**

*Eupithecia nephelata* Staudinger, 1897: Deutsche entomologische Zeitschrift, Iris **9** (2): 282. Syntypes 1♂, 1♀ (coll. O. Staudinger in MNHU), [Mongolia]: Uliassutai, Tumartin-Gol.

**Material.** Syntypes: 1♂, **Mongolia**, Uliassutai, 94, Led., *Nephelata* Stgr., Origin., Gen. vérifiés 1441/4 *Eupithecia nephalata* Stgr. [sic.] ♂, dét. E. De Laever 1954; 1♀, Uliassutai, 94, Led., *nephelata* ♀, Origin., Gen. vérifiés 1441/5 *Eup. nephalata* Stgr. [sic.] ♀, dét. E. De Laever 1954 (coll. O. Staudinger in MNHU). **NE Afghanistan**: 1♂, Wakhan-Tal, Langar, 3500 m, 11.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 243; 1♀, same locality, 3300 m, Zamestani Baharak, 10.vii.1971, UV-Li, Ebert & Naumann, coll. Nr. 242, Ratzel slide no. GU14208/2w (SMNK).

This pale-coloured Central Asian species has previously been recorded from Kyrgyzstan, Tajikistan, Pakistan/India (Jammu and Kashmir), western China (Xinjiang), and Mongolia. It is a new species for the fauna of Afghanistan. The moth is externally rather similar to the preceding species and was illustrated in Dietze (1910) and later in



Mironov et al. (2008c). The male and female genitalia were described and illustrated by De Laever (1956) for the first time.

### *Eupithecia marginata* Staudinger, 1892

*Eupithecia marginata* Staudinger, 1892: Deutsche entomologische Zeitschrift, Iris 5 (1): 257. Syntypes 2♂, 4♀ (coll. O. Staudinger and K. Dietze in MNHU), [China]: Kuldja-Gebiet. Incorrect subsequent spelling: *marginita*: De Laever (1956).

**Material.** Syntypes: 1♂, **China**, Kuldja Rkbl. 84, *marginata* Stgr., Origin., Gen. vérifiés 1451/3 *Eupithecia marginata* Stgr. ♂, Kuldja 84, dét. E. De Laever 1954; 1♀, *marginata* ♀ Kuldja, Origin., Gen. vérifiés 1451/4 *Eupithecia marginata* ♀, Kuldja, dét. E. De Laever 1954; 3♀, [small brownish circular label], Origin. (coll. O. Staudinger in MNHU). **Afghanistan:** 4♂, Paghman, 30 km NW v. Kabul, 2100–2200 m, 20–30.vii.1962, E. & A. Vartian leg., Vojnits slide no. 15110♂ (HNHM); 1♀, SE Afghanistan, Safed Koh, S-Seite, Kotkai, 2350 m, 4.viii.1967, M. Müller leg., Vojnits slide no. 19537♀ (SMNK).

*E. marginata* is a western Asian species ranging from Cyprus in the west through North Caucasus (Daghestan), Armenia, Azerbaijan, Iran, Uzbekistan, Tajikistan, and Kyrgyzstan to southeastern Kazakhstan (Tien-Shan Mts.) and northwestern province of China (Xinjiang) in the east. Not previously recorded from Afghanistan.

This species is externally very similar to the British nominate subspecies of *E. vulgata* (Haworth, 1809). Based on the structure of the male and female genitalia, it belongs to the *semigraphata* group (Schütze 1956). The female genitalia were described and illustrated in Petersen (1910) for the first time, and after that the genitalia of both sexes were pictured in the publications of De Laever (1956) and Viidalepp (1988).

### *Eupithecia exicterata* Mironov & Ratzel, 2008

*Eupithecia exicterata* Mironov & Ratzel, 2008: Transactions of the Lepidopterological Society of Japan 59 (3): 220, figs 16, 24, 25. Holotype ♂ (ZFMK), Pakistan: Hindukush Mts., 5 km E of Shandur pass, 72°38'E, 36°07'N, 3250 m.

**Material.** Holotype ♂, **Pakistan**, Hindukush Mts., 5 km E of Shandur pass, 72°38'E, 36°07'N, 3250 m, 24–25.vi.2000, leg. Z. Varga & G. Ronkay (ZFMK). – Paratypes: 3♂, same data (ZFMK, ZISP). 2♀, **India**, J & K, Kashmir, vic. Sonamarg, 2900 m, 13.viii.1988, leg. W. Thomas (ZFMK, ZISP); 1♀, Indien Uttar Pradesh, Gangotri, ca 3000 m, 6–9.viii.1993, Kautt & Weisz, Ratzel slide no. GU12905/1w (SMNS). 1♀, **Pakistan**, Karakoram Mts., Naltar valley, 74°09'22"E, 36°11'08"N, 2900 m, 20.vii.1998, leg. G. Csorba & L. Ronkay (HNHM); 1♂, 1♀, same data, 2800 m, 74°12'E, 36°09.6'N, respectively 18.vii.1998, leg. G. Csorba & L. Ronkay, slide ACG GL37 and 14.viii.1998, leg. Z. Varga & G. Ronkay, slide ACG GL16 (coll. László); 3♂, 3♀, Pakistan-West, Great Himalaya Mts., near Gabar, 3200 m, 21–24.viii.2004, leg. V. Gurko, Ratzel slides nos GU8705/1w, GU8705/2m, GU8705/3w (coll. Ratzel). SE **Afghanistan:** 1♀, Safed Koh, S-Seite, Kotkai, 2350 m, 20.vii.1968, M. Müller leg., Vojnits slide no. 19506♀ (SMNK).

This species, which is similar externally to *E. icterata* f. *subfulvata* (Haworth, 1809), was recently described on the basis of a large series, including 16 specimens from the western Himalayas (Pakistan and India). A single worn female was found in the Afghanian material of *Eupithecia* in SMNK.

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