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Typhonoya gen. nov. and *Weberolegra* gen. nov. - two new genera for African *Gastropacha* Ochsenheimer, 1810

(Lepidoptera, Lasiocampidae)

by

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Abstract: African species of *Gastropacha* Ochsenheimer, 1810, are revised. Taxon *Estigena* Moore, [1860] 1858-1859 **stat. rev.** is proposed again in original status of a separate genus. The species *africana* Holland, 1893 and *silvestris* Strand, 1918 are considered within *Estigena*, containing now 13 species. Two new genera are established: ***Weberolegra* gen. nov.** with the type-species *Tauscheria weberi* Tams, 1929 and ***Typhonoya* gen. nov.** with the type-species *Estigena longipennis* Hering, 1941; for both species the ♀♀ are described for the first time. Distributional maps and typical specimens for each species are pictured.

Zusammenfassung: Die afrikanischen Arten von *Gastropacha* Ochsenheimer, 1810 werden revidiert. Das Taxon *Estigena* Moore, [1860] 1858-1859 **stat. rev.** wird wieder im Rang einer getrennten Gattung betrachtet. Die Arten *africana* Holland, 1893 und *silvestris* Strand, 1918 werden zu *Estigena* gestellt, somit unfaßt die Gattung jetzt 13 Arten. Zwei neue Gattungen werden aufgestellt: ***Weberolegra* gen. nov.** mit der Typusart *Tauscheria weberi* Tams, 1929 und ***Typhonoya* gen. nov.** mit der Typusart *Estigena longipennis* Hering, 1941; für beide Arten werden die ♀♀ erstmals beschrieben. Verbreitungskarten und Abbildungen der Typen werden für jeder Art angegeben.

Introduction: The present article is devoted to the taxonomy of African moths traditionally considered within *Gastropacha* Ochsenheimer, 1810 or subordinated genera. Totally 5 species of the complex are known from Africa (in original combinations given):

Estigena africana Holland, 1893
Estigena silvestris Strand, 1918
Estigena longipennis Hering, 1941
Tauscheria muscovit Bryk, 1915
Tauscheria weberi Tams, 1929

It was not suspected to happen, but during the study of the type-specimens, polyphyly of the complex was found. This situation becames more complicate because in all special literature published after 1930, *T. muscovit* Bryk is treated as synonym of *E. africana* Holland, and the genus *Tauscheria* Bryk, 1915 as synomym of *Estigena* Moore, [1860] 1858-1859 (Aurivillius, [1930]; Tams, 1935; Collier, 1936). Moreover, *Estigena* Moore is treated as a synonym of *Gastropacha* Ochsenheimer, 1810 recently and the epithet "*Estigena*" is using to join a small species-group. Thus, some questions are arised:

- how the genus *Tauscheria* Bryk is related to the *Estigena* Moore;
- how the African moths are related to the Oriental *Estigena* Moore;
- what's a real systematic position for *Estigena* Moore between related *Gastropacha* Ochsenheimer, 1810 and *Stenophylloides* Hampson, [1893] 1892? The answers are given below in 'Results'.

Materials and methods: All photos for the article were made by Vadim V. Zolotuhin (Ulyanovsk, Russia). Necessary type-specimens storaging in The Natural History Museum, Carnegie Museum of Natural History, Riksmuseet Stockholm, and Royal Museum for Central Africa were used for the study. Their genitalia were also studied exept for *E. africana* Holland and *T. weberi* Tams. The material of all museum and private collections was investigated and is stipulated. The following abbreviations are used for the museum and private collections in the text:

CMNH: Carnegie Museum of Natural History (Pittsburgh, PA, U.S.A.),
CMS: private collection of Manfred Ströhle (Germany),
CRM: private collection of Raymond J. Murphy (Malawi),
CSP: private collection of Sergey N. Pugaev (Russia),
CVZ: private collection of Vadim V. Zolotuhin (Russia),
MCL: Musée des Confluences (Lyon, France),
MHNG: Museum d'histoire naturelle (Geneve, Switzerland),
MNHN: Muséum national d'Histoire naturelle (Paris, France),
MWM: Entomological Museum of Thomas J. Witt (Munich, Germany),
NHM: The Natural History Museum (London, Great Britain),
NMK: National Museum (Nairobi, Kenya),
RMCA: Royal Museum for Central Africa (Tervuren, Belgium),
RMS: Riksmuseet (Stockholm, Sweden),
ZMHU: Zoologisches Museum der Humboldt Universität (Berlin, Germany),
ZSM: Zoologische Staatssammlung (Munich, Germany),

All illustrations for the article were prepared by the author using Adobe Photoshop CS, some photos of the moths were modified for better perception.

Results

Relationships between *Tauscheria muscovit* Bryk, 1915 and *Estigena africana* Holland, 1893:

The genus *Tauscheria* Bryk is treated as a synonym of *Estigena* Holland, because *T. muscovit* Bryk (the type-species of the genus) is synonymised with *E. africana* Holland (Aurivillius, [1930: 212[). Accuracy of this hypothesis is doubtful, because Aurivillius was guided only by external characters of the moths, and only since 1935 the ♂ genitalia have been used in the lasiocampid

taxonomy (Tams, 1935: 48). Both species under consideration were described basing on single ♀♀. No additional information was found in literature on relationship of these two species. Thus, ♂♂ for both had to be found to prove or disprove their conspecifity or synonymy. They were found during analysis of museum collections; they could easily identified by specific "gastropachoid" pattern in the costal part of the hind wing. The study of ♂♂, similar externally to the ♀ holotype of *E. africana* Holland and ranged to the same territory, and to *T. muscovit* Bryk show remarkable similarity of their genitalia. Only one separating character was found - it was a geographically varying length of the vesica in the aedeagi, corresponding in the ductus bursae length in ♀♀ genitalia. But both characters change gradually in direction from West to East and from North to South (from Ghana to Zimbabwe), with some correlations. As the other characters (wing pattern, general size, shape of valvae in ♂♂ and vaginal plates in ♀♀) were identical, it was decided to treat these as clinal differences and respectively, all these moths as one species. Thus, *E. africana* Holland, 1893, and *T. muscovit* Bryk, 1915, are considered to be conspecific.

Relationships of the Oriental and African *Estigena* species: Traditionally the genus *Estigena* Moore joins the species of Oriental region, with the type-species *Megasoma pardale* Walker, 1855, described after ♂♂ from Java (syntypes in NHM). It is needed to compare genitalia of African taxa with those of *M. pardale* Wlk. to understand their relationship.

The ♂ genitalia of *M. pardale* Wlk. is characterised by a pair of short tergal processes, bifurcate valvae, clavate sacculus with dentate surface, bilobed juxta, tubular aedeagus, elongated vesica with basal and terminal clusters of needle-shaped cornuti.

The ♂ genitalia of *E. africana* Holland has certainly the same "gastropachoid" shape and differs only by sacculus without additional structures and much longer vesica with two basal and one terminal clusters of cornuti connected with a stretched row of single cornuti coming from top downwards. Shape of vesica therefore is similar to *E. xenapates* (Tams) and *E. leopoldi* (Tams) but differs in two, not a single, basal cluster of cornuti, known in some *Stenophylloides* Hampson, [1893] 1892: *clathrata* Bryk, 1948, *insularis* Zolotuhin, 2005 (see Zolotuhin, 2005).

Thus, *africana* Holland belongs doubtless to *Estigena* Moore. Therefore *Tauscheria* Bryk, 1915 **syn. nov.** is synonymised with *Estigena* Moore, [1860] 1858-1859.

Estigena silvestris Strand was described after a ♀ from D.R.C., and no ♂ was matched so far, also during preparation of the present revision. The genitalia of a typical *E. silvestris* Strand specimen was strongly damaged (pers. comm. of Vadim V. Zolotuhin) and additionally were fallen to pieces under preparation. The shape of vaginal plates is practically identical to *E. africana* Holland, but narrow spiral (2 turns) ductus bursae differs the species clearly. Therefore *silvestris* Strand also belongs to *Estigena* Moore.

Estigena silvestris Strand, 1918 inhabits the African continent and its phenotype and genitalia are similar to those of the Oriental taxa. It is supposed that in the Pleistocene ancestor penetrated into Africa through forests of Asia Minor and Saudi Arabia and formed the separated African population (later separated because of the aridization) beyond the Oriental range. It is possible to say, the African *Estigena* is an invader and not a native component of the African biota.

Two other species, considered always within *Gastropacha* - *weberi* Tams, 1929 and *longipennis* Hering, 1941 - differ from other *Estigena* species and are considered in a special part below.

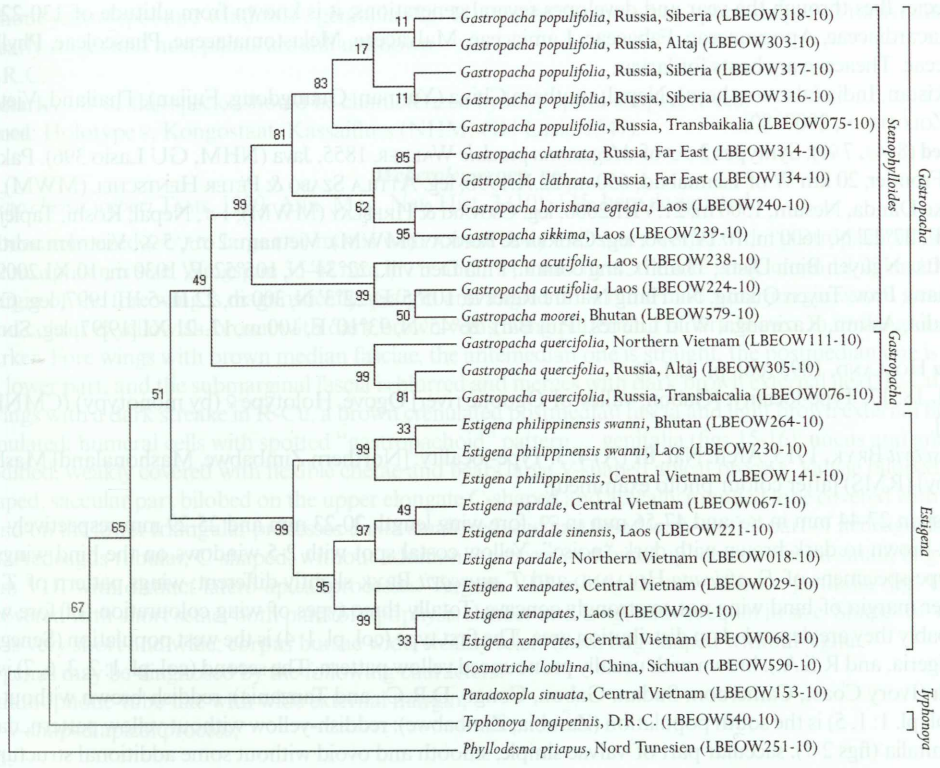
Taxonomical position of *Estigena* Moore, [1860] 1858-1859:

Estigena Moore was originally established as a separate genus, with the type-species *Megasoma pardale* Walker, 1855, from Java. The genus was treated close to the *Gastropacha* Ochsenheimer, 1810 and Tams (1935: 49) reviewed this status in writing: "I find no sound reason for treating the genera *Estigena* Moore, *Stenophylloides* Hampson, and *Tauscheria* Bryk as separate groups, as species which I list here under *Gastropacha* appear to me to form a homogenous group..." . Yves de Lajonquière (1976: 151) followed Tams, but he added: "...l'analogie des armures génitales des différentes espèces, autrefois disperses dans ces genres, est frappante et doit certainement l'emporter sur les légères modification de la nervation..." and also that "...incite Hampson à crées le genre *Stenophylloides*...". Zolotuhin (2005: 291) gave in the revision of the subgenus *Stenophylloides* Hampson, [1893] 1892 more important character for taxonomy: saccular part of valva is absent in ♂ genitalia. Constant characters differing ♂♂ genitalia of *Estigena* Moore and *Gastropacha* Ochsenheimer were not found so far. Completely *Estigena* Moore may be diagnosed by the following characters:

- middle-sized moths with narrow fore wings, with anal part of hind wings rather protruded;
- outer margin of wings is smooth to convex but never serrate or dentate;
- pattern of wings rarely reduced; yellow costal spot on the hind wing of males is distinct; dark "noise" on both wings is often typical;
- 2-5 windows on hind wings of males are characteristic for many species;
- bilobed valvae;
- vesica of varying length according to a species; one or two clusters of cornuti in base and one cluster on top, also may be stretched range of numerous cornuti from top to base.

The most important characters are narrow wings with outer margin smooth, costal spot and characteristic dark "noise" on the wings, however species without yellow costal spot are also known: *koniensis* Tams, 1935, *minima* de Lajonquière, 1979. The characters listed are enough to treat *Estigena* Moore at least as a subgenus within *Gastropacha* Ochsenheimer, but DNA analysis gives more information. In the study undertaken in the Biodiversity Institute of Ontario, Guelph (see www.boldsystems.org) under the project LBEOW, the DNA sequence was investigated for some Oriental *Gastropacha* Ochsenheimer and *Estigena* Moore and for *longipennis* Hering (see phylogramm, number of sequences in LBEOW-project shown in brackets). The evolutionary history was inferred using the Maximum Parsimony method. The bootstrap consensus tree inferred from 10000 replicates is taken to represent the evolutionary history of the taxa analyzed. Branches corresponding to partitions reproduced in less than 50% bootstrap replicates are collapsed. There were a total of 590 positions in the final dataset, out of which 126 were parsimony informative. Phylogenetic analyses were conducted in MEGA4 (Tamura, Dudley, Nei & Kumar, 2007).

Thus, three branches with different roots are clearly visible, one of them joins the *Estigena* Moore species, the other - *Gastropacha* Ochsenheimer and its subgenus *Stenophylloides* Hampson, and the third - *longipennis* Hering. That means that *Estigena* Moore, *Gastropacha* Ochsenheimer (with *Stenophylloides* Hampson) and *Typhonoya longipennis* (Hering) are distinct genera. This result may be surely partly mistaken because only 658 nucleotide pairs were used for analysis, but the study of smaller tissue samples undertaken in the Saratov State University for 1200 bp shown very similar results (unpublished).



Therefore, the status of *Estigena* MOORE, [1860] 1858-1859 **stat. rev.** is re-established here again. The following species are included (without known subspecies given):

africana HOLLAND, 1893
caesarea (ZOLOTUHIN & WITT, 2005) **comb. nov.**
encausta (HAMPSON, 1900) **comb. nov.**
koniensis (TAMS, 1935) **comb. nov.**
leopoldi (TAMS, 1935) **comb. nov.**
minima (DE LAJONQUIÈRE, 1979) **comb. nov.**
pardale (WALKER, 1855),
pelengata (ZOLOTUHIN & HOLLOWAY, 2006) **comb. nov.**
philippinensis (TAMS, 1935) **comb. nov.**
prionophora (TAMS, 1935) **comb. nov.**
silvestris STRAND, 1918
wilemani (TAMS, 1935) **comb. nov.**
xenapates (TAMS, 1935) **comb. nov.**

At present *Estigena* MOORE includes 13 species, two of them inhabiting Africa. The African taxa can be considered in detail now.

Estigena MOORE, [1860] 1858-1859 **stat. rev.**
Cat. lep. Ins. Mus. nat. Hist. East-India House **2**: 246.
Type-species: *Megasoma pardale* WALKER, 1855, List Spec. lep. Ins. Colln Br. Mus. **6**: 1453, by subsequent designation by MOORE ([1893] 1892-1893), Lepid. Ceylon **2**: 149.
= *Tauscheria* BRYK, 1915, Arch. Nat. **81** (A) **4**: 3. Type-species: *Tauscheria muscovit* BRYK, 1915, Arch. Nat. **81** (A) **4**: 3, by original designation. Synonymy was established by AURIVILLIUS ([1930] 1927: 212).

Diagnosis: Wingspan 32-46 mm in ♂♂ and 45-68 in ♀♀ (ZOLOTUHIN, 2009: 79), fore wing length 20-23 mm and 23-34 mm respectively. Outer margin of both wings smooth not dentate. Species mostly cannot be identified after external characters (ZOLOTUHIN, 2009: 79). Ground colour varies from light-brown to dark reddish-brown with dark "noise". Wings pattern may be reduced. Two medial fasciae crenulated, submarginal fascia blurred, dark discal dot on the fore wings present; medial fascia crenulated; in the hind wings, yellow costal spots (in ♂) sometimes protruded, often with central black dots; also may be some transparent windows on the hind wings. In ♂ genitalia uncus and gnathos are absent. Tegumen with a pair of short processes; valvae bifurcate; valvae bilobed; juxta simple bilobed, fused with aedeagus; aedeagus short tubular not modified and without apical spur; vesica of varying length; one or two cornutal clusters in the base and one terminal brush are present, also may be stretched range of cornuti from top to base. In ♀ genitalia both pairs of apophyses long. Vaginal plates distinct, without relief. Anthrum cup-shaped, distinct. Ductus bursae long, spiral, in different sclerotization degree.
Biology: Larvae are polyphagous, Oriental species mostly on arboreal Rosaceae and Fabaceae (ZOLOTUHIN, 2009: 79).
Distribution: Southern part of Eastern Palearctic, Indo-Malaysian region, Sunda Islands and Afro-tropical region.

An annotated list of species

Estigena pardale (WALKER, 1855) (col. pl. 1: 9, 10)
Megasoma pardale WALKER, 1855, List Spec. lep. Ins. Colln Br. Mus. **6**: 1453. Type-locality: Java. Syntypes 2 ♂♂ (NHM) [after colour photo examined].
Diagnosis: Wingspan 39-43 mm in ♂♂ and 59-61 in ♀♀, fore wing length 21-23 mm and 30-33 mm correspondingly. Externally not diagnosed. ♂ genitalia (fig. 1): Saccullus clavate and dentated. Vesica elongated; one cluster in the base and one terminal brush of cornuti. ♀ genitalia (fig. 10): Ostium large, ovoid. Ductus bursae large, strongly sclerotized, spiral-shaped (1 turn).

Biology: The species flies through the year and developes several generations; it is known from altitude of 130-2240 m. Different species from Anacardiaceae, Apocynaceae, Fabaceae, Lamiaceae, Malvaceae, Melastomataceae, Phaseoleae, Phyllanthaceae, Rosaceae, Sapindaceae, Theaceae are hosts for larvae.
Distribution: Pakistan, India (also southern), Nepal, southern China (Yunnan, Guangdong, Fujian), Thailand, Vietnam, Malaysia, Java, Sumatra (Zolotuhin, 2009: 80).
Material examined (8 ♂♂, 7 ♀♀): Syntypes 2 ♂♂ of *Megasoma pardale* Walker, 1855, Java (NHM, GU Lasio 396). Pakistan: 1 ♂, Pakistan, Prov. NW-Frontier, 20 km W of Islamabad, 650 m, 22.X.1998, leg. Attila Szabó & Péter Hentschel (MWM). Nepal: 1 ♂, 1 ♀, East-Nepal, Milke Danda, Nesum, 1500 m, 21.VIII.2000, leg. Csövári & Hreblay (MWM); 1 ♂, Nepal, Koshi, Taplejung area, adove Dhoban, 87°39' E, 27°22' N, 1600 m, 10.IV.1996, leg. Csorba & Ronkay (MWM). Vietnam: 2 ♂♂, 5 ♀♀, Vietnam northern, Cao Bang Prov., Phi Oak Mts., Nguyen Binh Distr., Thanh Cang comm., Phia Den vill., 22°34' N, 105°52' E, 1030 m, 10.XI.2009, leg. S. Pugaev (CSP); 1 ♂, Vietnam, Prov. Tuyen Quang, Na Hang Nature Reserve, 105°5' E, 22°3' N, 300 m, 22.II.-5.III.1997, leg. Csorba (MWM). India: 1 ♀, NE India, Assam, Kaziranga, Wild Life res., Pan Bari, 26°45' N, 93°10' E, 100 m, 12.-21.XI.[19]97, leg. Siniaev (MWM).

Estigena africana Holland, 1893 (col. pl. 1: 1-7)
Psyche **6**: 490, pl. 18: 17. Type-locality: [Gabon, valley of Ogooué river] Ogové. Holotype ♀ (by monotypy) (CMNH) [after colour photo examined].
= *Tauscheria muscovit* Bryk, 1915, Arch. Nat. **81** (A) **4**: 3. Type-locality: [Northern Zimbabwe, Mashonaland] Mashuna. Holotype ♀ (by monotypy) (RMS) [after colour photo examined].

Diagnosis: Wingspan 27-44 mm in ♂♂ and 47-56 mm in ♀♀, fore wing length 20-23 mm and 25-29 mm respectively. Ground colour varies from light-brown to dark-brown with dark "noise". Yellow costal spot with 2-5 windows on the hind wings of both sexes. Externally the type-specimens of *E. africana* Holland and *T. muscovit* Bryk slightly different: wings pattern of *T. muscovit* Bryk reduced and outer margin of hind wing not so strongly concave. Totally three types of wing colouration (of fore wings especially) were found; probably they are depended on distribution area. The first type (col. pl. 1: 4) is the west population (Senegal, Ivory Coast, Ghana, Togo, Nigeria, and R.S.A.): brown with usually pronounced yellow pattern. The second (col. pl. 1: 2, 3, 6, 7) is the population of Central Africa (Ivory Coast, Cameroon, Sudan, Gabon, Congo, D.R.C., and Tanzania): reddish-brown without yellow pattern. And the third (col. pl. 1: 1, 5) is the south population (Zambia, Zimbabwe): reddish-yellow without yellow pattern, dark "noise" may be reduced. ♂ genitalia (figs 2-7): saccular part of valvae simple, smooth and ovoid without some additional structure. Two clusters of cornuti in the base of vesica; special bag-shaped knob is distinct basally for better fixation in ♀♀ ductus bursae.
♀ genitalia (figs 8-9, 11-13): very long ductus bursae often spiraled in 1.0 additional turn and protruded ductus' process for better fixation with ♂ aedeagus are charcteristic.
Biology: Some larvae were found on "...Césalpiniacée forestière *Erythrophleum guineense*..." by G. Don. Duration of live-stages: larva - 23-27 days, pupa - 6-10 days (in Vuattoux, 1991: 248). The moths were collected in March-May and July-December between 400-1250 m.
Distribution: Senegal, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, R.C.A., Sudan, Gabon, Congo, D.R.C., Uganda, Tanzania, Zambia, Zimbabwe.
Taxonomical remarks: The ♀ type-specimen of *Estigena africana* Holland, 1893 from Gabon was not dissected, but ♀♀ from the nearest locations did not show significant variability (fig. 9).
Material examined (75 ♂♂, 17 ♀♀): Holotype ♀ of *Estigena africana* Holland, 1893, [Gabon, valley of Ogooué river] Ogové (CMNH); holotype ♀ of *Tauscheria muscovit* Bryk, 1915, [Northern Zimbabwe, Mashonaland] Mashuna, leg. Marshall (RMS, GU 9466). Senegal: 1 ♂, Senegal, Cap Skirring, VII.2008 (CMS). Sierra Leone: 1 ♂, Sierra Leone, Tingi Hills Forest Reserve, Singi-Singi Mts., 46 km NE Koido-Sefadu, near Bandaperei (Kono), 8°57.083'N, 10°44.751W, 800 m, 13.-15.IV.2010, leg. Rudloff (CMS). Ivory Coast: 1 ♂, Cote d'Ivore (NHM, GU Lasio 1534); 1 ♂, Afrique Occidentale, Côte d'Ivoire, 1919, leg. Cremer (NHM, GU Lasio 1541); 1 ♂, Ivory Coast, Danane, 24.IV.[19]82, leg. Dr. Politzar (ZSM, GU LAS-10-039); 1 ♂, Ivory Coast, Foret de Tai, 7.VIII.[19]85, leg. Dr. Politzar (ZSM); 1 ♂, Ivory Coast, Foret de Tai, 24.X.[19]84, leg. Dr. Politzar (ZSM, GU LAS-10-045); 1 ♀, Ivory Coast, National-park Tai, 16.IV.1982, leg. Dr. Politzar (CMS). Ghana: 1 ♀, Gold Coast, Sekondi (NHM, GU Lasio 1533). Togo: 1 ♂, Togo, Klouto, 5.VIII.[19]69, leg. J. Poulard (MCL). Nigeria: 1 ♀, Nigeria, Jemaa, 26.III.[19]75, leg. Dr. Politzar (MWM); 1 ♀, Nigeria, Jemaa, 20.VII.1975, leg. Dr. Politzar (CMS); 1 ♂, N-Nigeria, Jemaa, 12.X.[19]75, leg. Politzar (ZSM); 1 ♂, N. Nigeria, Jemaa, 19.IX.1971, leg. Dr. Politzar (ZSM, GU LAS-10-044); 1 ♀, S. Nigeria: ore, 27.XII.1970, leg. Dr. Politzar (ZSM, GU LAS-10-035). Cameroon: 1 ♂ (incorrectly labeled as holotype of *E. africana* Holland, 1893) Kamerun, Akofaim, 1914, leg. Tessmann (ZMHU); 1 ♂, Cameroons, Ja river, Bitje, 610 m, X-XI.1913, wet season (NHM, GU Lasio 1535); 1 ♀, Cameroons, Ja river, Bitje, IV, leg. G. L. Bates (NHM, GU Lasio 1537). R.C.A.: 1 ♂, R.C.A., Boukoko, 30.VII.[19]70, leg. J. Poulard (MCL); 1 ♂, R.C.A., Préfecture de la Lobaye, Mbata, 9.VIII.1969, leg. J. Plante (MHNG). Congo: 12 ♂♂, 1 ♀, Congo, D'Odzala Parc National, 1°00' N, 15°00' E, 450 m, 29.I.-3.III.1997, leg. S. Murzin & V. Siniaev (MWM, GU 15.993, 16.027, 16.047); 45 ♂♂, 5 ♀♀, Odzala Nat. Park, 400-500 m, 29.I.-3.III.1997, leg. Siniaev & Murzin (MWM). D.R.C.: 1 ♂, Belg. Congo, Elisabethville, leg. Ch. Seydel (ZMHU); 1 ♀, Belgian Congo: Ituri forest, 1160-1250 m, III.-IV.1930, begin. wet season (NHM, GU Lasio 1536). Sudan: 1 ♀, South-Sudan, Tembura, XII.1922, acq. Janson (NHM, GU Lasio 1538). Tanzania: 1 ♂, Tanzanie: Morogoro province, Nguru mounts, IV.2004 (MWM). Zambia: 1 ♀, N.W. Rhodesia: Solwezi, 5.VII.1917, leg. H. C. Dollman (NHM, GU Lasio 1539); 1 ♂, N.W. Rhodesia: Solwezi, 3.V.[1917], leg. H. C. Dollman (NHM, GU Lasio 1540); 1 ♂, Zambia, Kafue NP, near Westborder, I.2010, leg. Robert Beck (CMS).
The species is also known from Grassfield (Liberia), Kolwezi (D.R.C.), Mbala (Zambia), Abercorn (Zambia), Entebbe (Uganda), Bugoma forest (Unyoro, Uganda) (26 specimens, coll. NMK, pers. comm. of Lars Kühne) and from Kenema (NW Sierra Leone), Lamto, Yao Blé (Ivory Coast), Ebogo, Rte. Edea-Douala km 15, Pout Kelle (Cameroon), Uele: Paulis, Kibomboma, Lubumbashi, P.N.A., Mont Buliwa, Kolwezi (all D.R.C.) (11 specimens, coll. RMCA, pers. comm. of Vadim V. Zolotuhin).

Estigena silvestris Strand, 1918 (col. pl. 1: 8)
Lepid. Niepeltiana., Nachtr.: 1, pl. 18: 3. Type-locality: [D.R.C., river Kasai] Kongostaat, Kassaifluß. Holotype ♀ (by monotypy) (NHM) [after colour photo examined].
= *Estigena sylvestris* [sic], Tams (1935), Mem. Mus. Royal Hist. nat. Belgique **4** (12): 49.

Diagnosis: Wingspan 49 mm, fore wings length 25 mm. Wings ground colour is pale sandy brown. The wings pattern is reduced.

Hind wings without yellow spot and windows. ♀ genitalia (fig. 14) may be diagnosed by spiral-shaped (2 turns) ductus.
Biology: Male, early stages and host plants are still unknown.
Distribution: D.R.C.
Taxonomical remarks: ♂♂ of this species should be characterized by long spiral-shaped vesica.
Material examined: Holotype ♀, Kongostaat, Kassaifluss (NHM, GU Lasio 1547).

***Weberolegra* gen. nov.**

Type-species: *Tauscheria weberi* Tams, 1929, Ann. Mag. Nat. Hist. **3** (10): 145, here designated.

Description: Moderately sized (♂♂) to large (♀♀) moths with robust body and short wings, with "gastropachoid"-like external and distinct sexual dimorphism is size. Wingspan 35-42 mm in ♂♂ and 57-61 mm in ♀♀, the fore wing length 18-22 and 32-34 mm respectively. Outer margin of the fore wing is diagnostically straight and angled on A1; the hind wing margin waved weakly (especially in ♀♀). Wing ground colour is yellowish-brown with dark brown veins, wing patterning is dark brown; in ♀♀ the ground colour of the fore wings is darker. Fore wings with brown median fasciae, the antemedian one is straight, the postmedian one is strongly curved, with crenulated lower part, and the submarginal fascia is blurred and merges with dark brown external field; R-Cu cell with vertical streake. Hind wings with a dark streake in R-Cu, a brown crenulated postmedian fascia and light brown external field with submarginal fascia crenulated; humeral cells with spotted "gastropachoid" pattern. ♂ genitalia (figs 15-16): uncus and gnathos are absent. Tegumen is modified, weakly covered with flexible chetae and bears large V-shaped apical process. Valvae bilobed; cuccular part is short, hook-shaped, saccular part bilobed on the upper elongate C-shaped and apically rounded lobe covered with elastic chetae on inner margin, and on the lower triangular processes. Juxta small, reduced and fused with ventral part of aedeagus base and cucculli. Saccus reduced. Aedeagus tubular, C-shaped, without additional process and basal apodemes. Vesica small, bag-shaped, without cornuti. Sternum VIII with distinct latero-apical processes. Tergum VIII mostly de-sclerotised. ♀ genitalia (fig. 18): Papilla analis short, densely covered with short setae; both pairs of apophysis slender and long, almost equal in size. Shapes of vaginal plates are special. Ductus is very short and wide; corpus bursae wide, weakly sclerotized, bag-shaped without signa.
Diagnosis: The genus may be diagnosed by the following characters:
- Fore wing is gramophone-tube-like with wide external margin;
- tegumen with V-shaped apical process;
- valvae bilobed;
- sacculus bilobed;
- sternum VIII with distinct latero-apical processes;
- ductus very short.

Distribution: Ivory Coast, Liberia, Cameroon, Gabon, D.R.C.
Taxonomical remarks: Type-specimen of *Tauscheria weberi* Tams from Cameroon was not dissected because it can be undoubtedly identified in any sample. Some external (not structural) similarities can be noted with species of *Theophasida* Zolotuhin & Prozorov, 2010, especially with *superba* (Aurivillius, 1914), *obusta* (Tams, 1929), and *cardinalli* (Tams, 1926). But here the tergal processes are not broad, valvae hook-like, not bifurcated, juxta bilobed, with lobes finger-shaped, aedeagus short and straight, sternum VIII is strongly desclerotized, bow-shaped (fig. 17). Also both genera are externally distinct. As *W. weberi* Tams, 1929 **comb. nov.** has no closer relatives in known genera, a separate genus is established.
Etymology: The genus name is devoted to H. L. Weber - famous collector, joined with modified Latin 'lego' means 'collected'.

***Weberolegra* gen. nov.** *weberi* (Tams, 1929) **comb. nov.** (col. pl. 1: 15-18)
Tauscheria weberi Tams, 1929, Ann. Mag. Nat. Hist. **3** (10): 145. Type-locality: Kamerun, Efulen. Holotype ♂ (by monotypy) (CMNH) [after colour photo examined].

Diagnosis: The species may be diagnosed by the gramophone-like fore wings with smooth external margin, contrast yellowish-brown pattern, spotted "gastropachoid" pattern in humeral cells. In ♂ genitalia valvae bifurcated, cucculus bilobed, aedeagus C-shaped and specific sternum VIII are diagnostic.
Biology: The moths were collected in January-April and July-November from the altitude of 700 m.
Distribution: Liberia, Ivory Coast, Cameroon, Gabon, D.R.C.
Material examined (9 ♂♂, 2 ♀♀): Holotype ♂ of *Gastropacha weberi* Tams, 1929, Kamerun, Efulen, 10.XI.1922, leg. H.L. Weber (CMNH). Liberia: 1 ♂, Liberia, Nimba, Grassfield, VIII.-IX.1967, leg. A. Forbes-Watson (NHM, GU Lasio 1532). Ivory Coast: 1 ♂ Cote d'Ivore, Forêt classée du Mabi, 10.X.1996, leg. Michael & Yol. Camp, Ugo Dall'Asta (RMCA); 1 ♂, Cote d'Ivoire, Azaguié, II.1964, leg. Guerout (MNHN, GU 3337). Cameroon: 1 ♂, Camerun: Rte. Edea-Douala, km 20, 5.VII.1992, leg. Th. Bouyer (RMCA). Gabon: 3 ♂♂, Gabon, Belinga, Camp Central, 700 m, 29.III.[19]62, 25.I.[19]63, 3.IV.[19]63, leg. G. Bernardi (MNHN, GU 2005-02). D.R.C.: 1 ♂, 2 ♀♀, Lusambo, 16.VII., 28.VII., 3.X.1949, leg. Dr. M. Fontaine (RMCA, GU 000005127, GU 000005126).

***Typhonoya* gen. nov.**

Type-species: *Estigena longipennis* Hering, 1941, Ann. Mag. Nat. Hist. **3** (10): 145, here designated.

Description: Moderately sized moths with weak sexual dimorphism. Wingspan 33-38 mm in ♂♂ and 44 mm in ♀♀, fore wings length 16-18 and 20-22 mm correspondingly. Ground colour is brown to reddish-brown with dark "noise". Outer margin of fore wing is rather waved with A1 embedded, tornal part turns down on A2+A3. Hind wings in males with anal part protruded. Fore wing with median fasciae crenulated, submarginal fascia blurred, discal dot and usually with two dark hook-like spots. Hind wing with median fascia crenulated, with light premedian field. Thorax bears light triangle spot. ♂ genitalia (figs 19-20): uncus and gnathos are absent. Tegumen wide with pair of processes. Valvae short finger-shaped, fused in a base. Juxta bilobed with lobes elongated finger-shaped. Aedeagus short tubular without modifications. Vesica bag-shaped with one large hook-like cornutus. Sternum VIII with caudal part embedded; apodemes are absent. Tergum VIII with wide membraneous field in the middle. ♀ genitalia (fig. 21): papilla analis short, densely covered with short setae; both pairs of apophyses slender and long, almost equal in size. Vaginal plates sclerotized enough and specific-shaped. Ostium chink-like. Ductus short, sclerotized; bursa low-sclerotized, bag shaped, without signa.
Diagnosis: The genus may be diagnosed by the following characters:

• anal zone protruded on hind wing;
• metathorax contrastly coloured and covered with scales clasped;
• valvae are bilobed, cuccular lobes fused in base;
• vesica with one large cornutus;
• ostium chink-like.

Distribution: Liberia, Ivory Coast, D.R.C., Kenya, Tanzania, Zambia, Malawi.

Etymology: Typhon in Greek mythology is a son of Gaia and Tartar, hundred-arm and hundred-head monster, disputed Zeus' power at heavens, and put by him into volcano Etna.

***Typhonoya* gen. nov.** *longipennis* (Hering, 1941) **comb. nov.** (col. pl. 1: 11-14)

Estigena longipennis Hering, 1941, Ann. Mag. Nat. Hist. **3** (10): 145. Type-locality: [D.R.C.] Elisabethville. Holotype ♂ (by monotypy) (CMNH) [colour photo examined].

Diagnosis: Ground colour is brown to reddish-brown with dark "noise". Post median fascia can be as crenulate so dentate. The species may be diagnosed by shape of wings, thorax' spot. In ♂ genitalia: valvae short and fused, bilobed juxta, vesica with one cornutus. Externally may be confused with species of *Nirbiana* Zolotuhin & Prozorov, 2010: *micha* (Druce, 1899), and *obscura* (Hering, 1941). But they are externally darker brown (♂♂) and in ♂ genitalia valvae resemble horns of deer or elk (Zolotuhin & Prozorov, 2010). Also *T. longipennis* (Hering, 1941) resembles externally some *Pseudometa* Aurivillius, 1901, but they are smaller, without protruded anal part of the hind wing and ♂ genitalia quite distinct, with valvae are not fused and distal processes of vinculum.

Biology: The moths were collected in January, February, April, May, July, October, and December between 0-1953 m.

Distribution: Liberia, Ivory Coast, D.R.C. Kenya, Tanzania, Zambia, Malawi.

Material examined (11 ♂♂, 2 ♀♀): Holotype ♂ of *Estigena longipennis* Hering, 1941, Elisabethville, IV 1930, leg. Ch. Seydel (RMCA, GU 2005-29). Liberia: 1 ♂, Liberia, Nimba, Grassfield, IV.1968, leg. A. Forbes-Watson (NHM, GU Lasio 1516). Ivory Coast: 1 ♂, Elfenbeinküste, San Pedro, 13.-16.XII. [19]76, leg. Dr. Politzar (ZSM, GU LAS-10-042). D.R.C.: 5 ♂♂, Congo (Zaire), 35 km SSE Kisangani, vill. Yoko, 00°17'N, 25°17'E, 413 m, 12.II.2008, leg. A. Gurkovich & V. Zolotuhin (MWM, GU 13.720; CVZ 1 ♂ in 96% alcohol). Kenya: 1 ♂, Kenya, South Coast, Marenche forest, X.[19]99, leg. Politzar (ZSM, GU LAS-10-041); 1 ♂, Kenya, South Coast, Buda Forest, 0 m, Lf., 7.I.1995, leg. Dr. Politzar (MWM, GU 16.036). Tanzania: 1 ♂, Tanzanie: Rukwa Province, Mbizi Mts, N. de Mpwapwa, 8°14.343' S, 31°50.507 E, 1953 m, 21.V.2004, leg. Ph. Darge (MWM, GU 16.046). Zambia: 1 ♀, N.W. Rhodesia: Solwezi, VII.1917, leg. H. C. Dollman (NHM, GU Lasio 1517). Malawi: 1 ♂, N. Malawi, Mzimba dist., Luwawa rd., Perekeze Forest Reserve, 12°05' S, 33°40' E, 1670 m, 30.I.2005, leg. R. J. Murphy (CRM). Zimbabwe: 1 ♀, Salisbury, XII.[19]16 (NHM).
The species is also known from Kalinzu forest (2 specimens, coll. NMK, pers. comm. of Lars Kühne).

As a result of this revision two new genera for the African lasiocampids are described: ***Weberolegra* gen. nov.** and ***Typhonoya* gen. nov.** The new genera are placed into the tribe Gastropachini Newmoegen & Dyar, 1893 because of the specific venation on the hind wing. The distribution area and specific score of *Estigena* Moore [1860] 1858-1859 is specified. More investigations of DNA in the future will help to understand the relationships between African and Oriental moths of *Estigena* Moore, [1860] 1858-1859.

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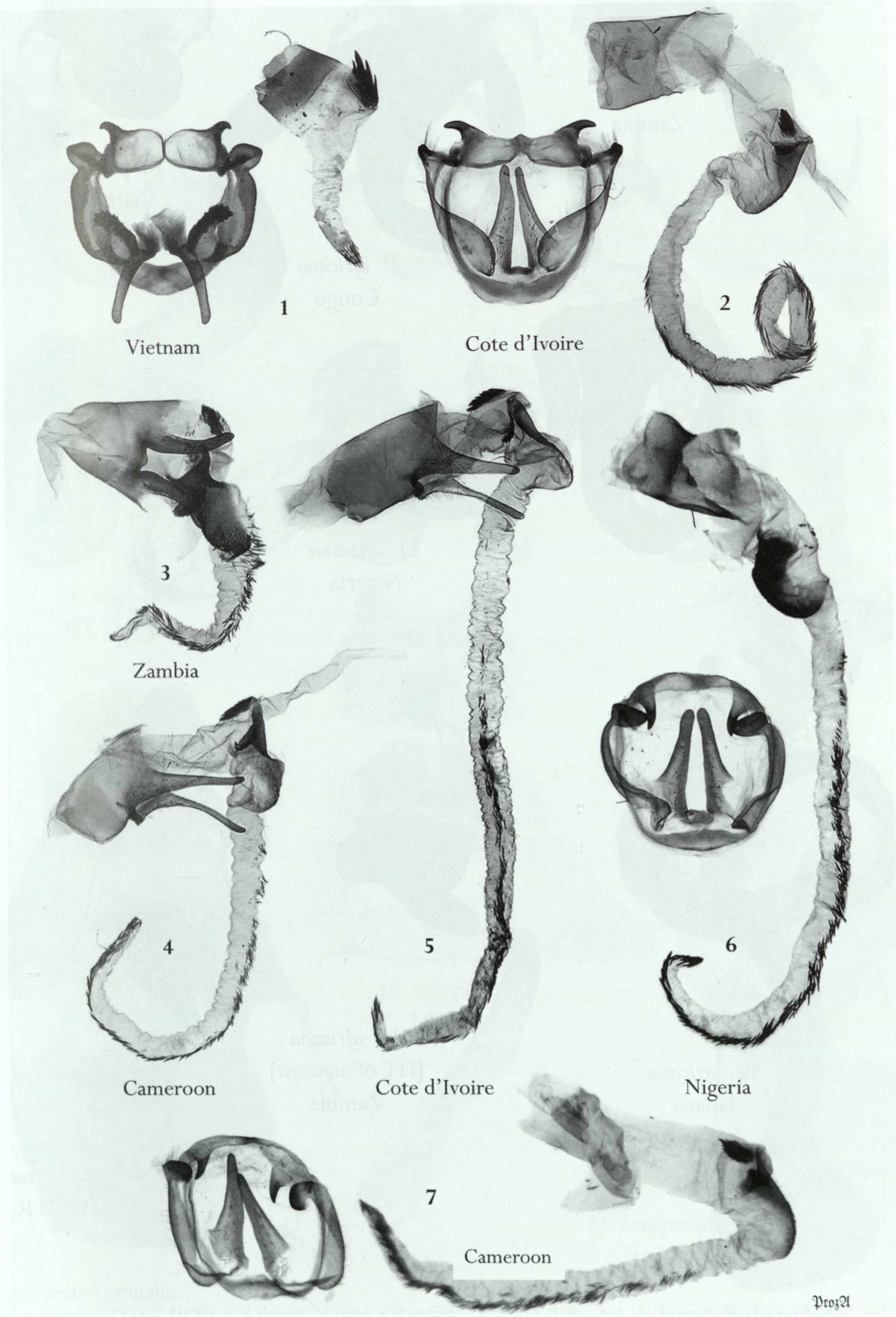
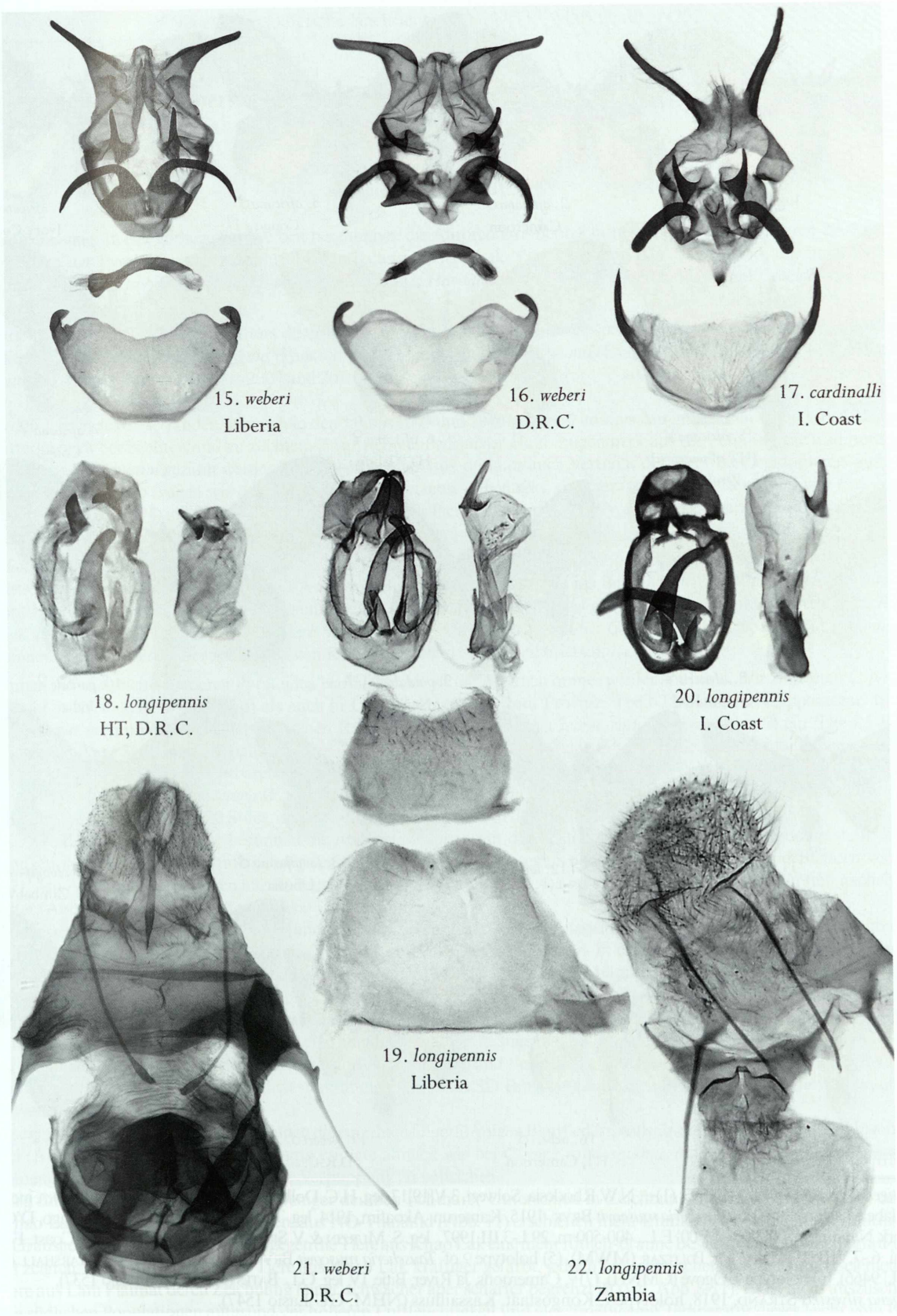
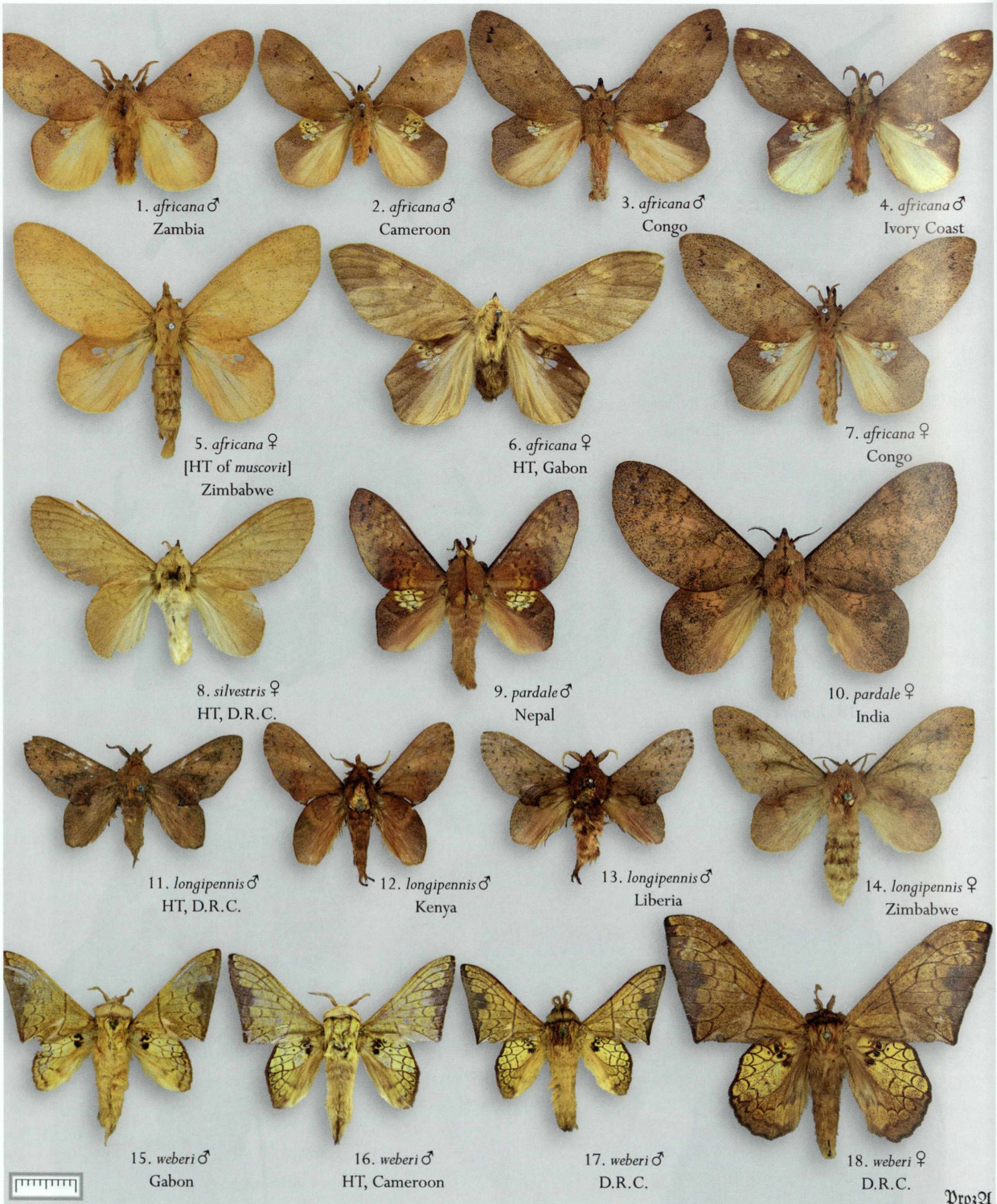


Figs 1-7: ♂ genitalia (aedeagi extracted, vesica enverted).
1: *Estigena pardale* (WALKER, 1855), Vietnam northern, Cao Bang Prov., Phi Oak Mts., Nguyen Binh Distr., Thanh Cang comm., Phia Den vill., 22°34' N, 105°52' E, 1030 m, 10.XI.2009, leg. S. PUGAEV (CSP). 2-7: *Estigena africana* HOLLAND, 1893. (2) Cote D'Ivore (NHM, GU, Lasio 1534), (3) N.W. Rhodesia, Solwezi, 3.V.[19]17, leg. H. C. DOLLMAN (NHM, GU Lasio 1540), (4) Cameroons, Ja River, Bitje, 610 m, X.-XI.1913, wet season (NHM, GU Lasio 1535), (5) Afrique Occidentale, Cote d'Ivoire, 1919, leg. CREMER (NHM, GU Lasio 1541), (6) N. Nigeria, jemaa, 19. IX.1971, leg. Dr. POLITZAR (ZSM, GU LAS-10-044), (7) incorrectly labeled as holotype ♂ of *Tauscheria muscovit* BRYK, 1915, Kamerun, Akoafim, 1914, leg. TESSMANN (ZMHU).

Figs 8-14: ♀ genitalia.
8, 9, 11-13: *Estigena africana* Holland, 1893, N.W. Rhodesia: Solwezi, 5.VII.1917, leg. H. C. Dollman (NHM, GU Lasio 1539). (9) S. Nigeria: ore, 27.XII.1970, leg. Dr. Politzar (ZSM, GU LAS-10-035), (11) D'Odzala Parc National, 1°15'N, 15°00'E, 400-500 m, 29.I.-3.III.1997, leg. S. Murzin & V. Siniaev (MWM, GU 15.993), (12) Gold Coast, Sekondi (NHM, GU Lasio 1533), (13) holotype ♂ of *Tauscheria muscovit* Bryk, 1915, Mashuna, leg. Marshall (RMS, GU 9466).
14: *Estigena silvestris* Strand, 1918, holotype, Kongostaat, Kassaifluss (NHM, GU Lasio 1547).
10: *Estigena pardale* (Walker, 1855), Vietnam northern, Cao Bang Prov., Phi Oak Mts., Nguyen Binh Distr., Thanh Cang comm., Phia Den vill., 22°34' N, 105°52' E, 1030 m, 10.XI.2009, leg. S. Pugaev (coll. A. Skrobotov).



Figs 15-18: ♂♂ and ♀♀ genitalia.
15: *Weberolegra weberi* (Tams, 1929), ♂, Liberia, Nimba, Grassfield, VIII.-IX.1967, leg. A. Forbes-Watson (NHM, GU Lasio 1532).
16: *Weberolegra weberi* (Tams, 1929), ♂, Lusambo, 28.VII.1949, leg. Dr. M. Fontaine (RMCA, GU 000005126).
17: *'Opisthodontia' cardinalli* Tams, 1926, ♂, Ivory Coast, Ferke, 12.X.[19]82, leg. Dr. Politzar (ZSM, GU LAS-10-002).
18: *Typhonoya longipennis* (Hering, 1941), holotype ♂ of *E. longipennis* Hering, 1941, Elisabethville, IV.1930, leg. Ch. Seydel (RMCA, GU 2005-29).
19: *Typhonoya longipennis* (Hering, 1941), ♂, Liberia, Nimba, Grassfield, IV.1968, leg. A. Forbes-Watson (NHM, GU Lasio 1516).
20: *Typhonoya longipennis* (Hering, 1941), ♂, Elfenbeinküste, San Pedro, 13-16.XII.[19]76, leg. Dr. Politzar (ZSM, GU LAS-10-042).
21: *Weberolegra weberi* (Tams, 1929), ♀, Lusambo, 16.VII.1949, leg. Dr. M. Fontaine (RMCA, GU 000005127).
22: *Typhonoya longipennis* (Hering, 1941), ♀, N.W. Rhodesia: Solwezi, VII.1917, leg. H. C. Dollman (NHM, GU Lasio 1517).



1-7: *Estigena africana* Holland, 1893: (1) ♂, N.W. Rhodesia, Solwezi, 3.V.[19]17, leg. H.C. Dollman (NHM, GU Lasio 1540), (2) ♂, incorrectly labeled as holotype of *Tauscheria muscovit* Bryk, 1915, Kamerun, Akoafim, 1914, leg. Tessmann (ZMHU), (3) ♂, Congo, D'Odzala Park National, 1°00' N.B., 15°00' E.L., 400-500 m, 29.I.-3.III.1997, leg. S. Murzin & V. Siniaev (MWM), (4) ♂, Ivory Coast, Foret de Tai, 6.-7.VIII.[19]85, leg. Dr. Politzar (MWM), (5) holotype ♀ of *Tauscheria muscovit* Bryk, 1915, Mashuna, leg. Marshall (RMS, GU 9466), (6) holotype ♀, Ogové (CMNH), (7) ♀, Cameroons, Ja River, Bitje, IV, leg. G.L. Bates (NHM, GU Lasio 1537).

8: *Estigena silvestris* Strand, 1918, holotype ♀, Kongostaat, Kassaifluss (NHM, GU Lasio 1547).

9, 10: *Estigena pardale* (Walker, 1855): (9) ♂, East-Nepal, Milke Danda, Nesum, 1500 m, 21.VIII.2000, leg. Csóvári & Hreblay (MWM), (10) ♀, NE India, Assam, Kaziranga, Wild Life res., Pan Bari, 26°45' N, 93°10' E, 100 m, 12.-21.XI.[19]97, leg. Siniaev (MWM).

11-14: *Typhonoya longipennis* (Hering, 1941): (11) holotype ♂ of *Estigena longipennis* Hering, 1941, Elisabethville, IV.1930, leg. Ch. Seydel (RMCA, GU 2005-29), (12) ♂, Kenya, South Coast, Buda Forest, 0 m, Lf., 7.I.1995, leg. Dr. Politzar (MWM, GU 16.036), (13) ♂, Liberia, [mount] Nimba, Grassfield, III.1968, leg. A. Forbes-Watson (NHM), (14) ♀, N.W. Rhodesia: Solwezi, VIII.1917, leg. H. C. Dollman (NHM, GU Lasio 1517)

15-18: *Weberolegra weberi* (Tams, 1929): (15) ♂, Gabon, Belinga, 700 m, 3.IV.[19]63, leg. G. Bernardi (MNHN), (16) holotype ♂ of *Tauscheria weberi* Tams, 1929, Camerun, Efulen, 10.XI.1922, leg. H. L. Weber (CMNH), (17) ♂, Lusambo, 28.VII.1949, leg. Dr. M. Fontaine (RMCA, GU 000005126), (18) ♀, Lusambo, 16.VII.1949, leg. Dr. M. Fontaine (RMCA, GU 000005127).