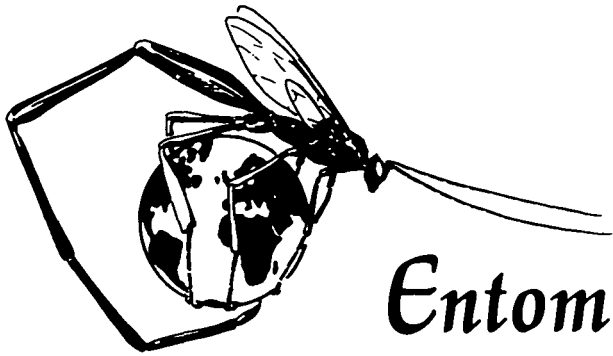

Entomofauna

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The Exenterine Genus *Exenterus* HARTIG, 1837, in the Oriental Region

(Hymenoptera, Ichneumonidae)[1]

V. K. Gupta

Abstract

Two new species of *Exenterus*, namely *E. orientalis* **sp. nov.** and *E. phaeopyga* **sp. nov.**, are described from the mountains of India, Pakistan and Taiwan, recording this Holarctic genus from the Oriental Region for the first time. The species of this genus are parasites of diprionid sawflies on conifers.

Zusammenfassung

Exenterus orientalis **sp. nov.** und *Exenterus phaeopoyga* **sp. nov.** werden aus den Bergen von Indien und Pakistan beschrieben.

Key words: Ichneumonidae, *Exenterus*, Systematics, Orient. New taxa.

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Introduction

Exenterus HARTIG, 1837, (Ichneumonidae: Tryphoninae: Exenterini) a moderate sized genus occurring in the Holarctic Region. Members of this genus are ectparasites of the larvae of diprionid sawflies feeding on coniferous trees. As in all other species of Tryphoninae, the eggs have a stalk, are carried on the ovipositor, and are attached to the host by inserting the stalk into the host integument. Some of the more recent taxonomic studies on the genus are

by CUSHMAN (1940, 1943), KERRICH (1952), MASON (1962), and KASPARYAN & TOLKNAITZ (1981).

MASON (1967) and PSCHORN-WALCHER (1987) have discussed the egg structure of the various species and correlated it with their distribution, abundance, oviposition behavior, and phylogeny.

Considerable attention is currently being paid to biological and ecological studies on the Palearctic species of the genus in relation to biological control of the pine sawflies (EICHHORN 1981; GURYANOVA 1981, 1984; PSCHORN-WALCHER 1987).

Two new species of *Exenterus* are described here from the mountains of India, Pakistan and Taiwan, extending the range of the genus to the Oriental Region. They belong to the *amictorius* species group of KERRICH (1952) by having an impressed clypeus, slender abdomen, and non-pectinate tarsal claws, but do not match with any of the known species.

Genus *Exenterus* HARTIG

Exenterus HARTIG, 1837. Arch. f. Naturgesch., 3: 156.Type species: [*Tryphon marginatorius* (FABRICIUS) GRAVENHORST] = *amictorius* PANZER; monobasic.

Picroscopus FOERSTER, 1869. Verh. Naturh. Ver. Rheinlande, 25: 195. Syn. by KERRICH, 1952. Type-species: *Tryphon ictericus* GRAVENHORST included by THOMSON, 1883.

Actenonyx FOERSTER, 1869. Verh. Naturh. Ver. Rheinlande, 25: 195. Name preoccupied by WHITE, 1846. Syn. by TOWNES, 1944 Type-species: [*Ichneumon marginatorius* FABRICIUS] = *amictorius* PANZER; included by SCHMIEDEKNECHT, 1911.

TOWNES (1969) has provided a key to differentiate the Exenterini (=Cteniscini) from other Tryphoninae, and a key to distinguish *Exenterus* from other Exenterine genera.

The salient features of the genus are: Body usually short, stout, coarsely punctate, and with black and yellow markings. Head moderately swollen posteriorly. Clypeus moderately convex, with its apical margin broadly arched or medially truncate. Mandibular teeth almost equal in length. Notauli absent. Subtegular ridge moderately swollen, normal, without any longitudinal slot in its posterior part nor lamellate. Propodeum convex, areola when present wider than □_□long. Apex of hind tibia rounded ventrally, with an apical fringe of small hairs, without any polished flat area on its inner side between the bases of tibial spurs and tarsus (cf *Kristotomus* and related genera). Tarsal claws pectinate or not so. Tergite 1 wide, dorsally flat, with basolateral flanges just above glymma, its

dorsolateral carina passing just above the spiracles. Abdomen wider apically and curved, tergites 2-4 rather coarsely punctate, with tergite 2 tending to be rugoso-punctate to aciculo-punctate. Ovipositor decurved, short and stout, slightly compressed apically. Female subgenital plate large, flat, convex, or folded medially, its apical margin convex. Male subgenital plate flat, shorter.

Egg structure variable, with a small single stalk and a knob-like anchor, or specialized with stalk at each end of the egg and anchor enlarged and enclosing part of the egg; the modification of the anchor from a simple type to the one enclosing the egg representing an evolutionary sequence (MASON 1967; PSCHORN-WALCHER 1987).

Key to the Oriental species

Abdomen slender. Tergite 1 2.0x as long as its apical width, its dorsomedian and dorsolateral carinae not prominent. Tergite 2 as long as or longer than wide (1.0-1.2x) (Fig. 3,4,6), usually aciculo-punctate, its basolateral grooves shallower and more oblique (Fig. 3). Propodeum without carinae or yellow mark, rugoso-punctate (Fig. 8). Abdomen black with apical margins of tergites yellow (Fig. 3,4), sometimes yellow margins narrow to indistinct (Fig. 6) and abdomen largely black. India, Pakistan and Taiwan. ..... 1. *orientalis* **sp. nov.**

Abdomen comparatively stout. Tergite 1 1.75x as long as its apical width, its dorsomedian and dorsolateral carinae strong. Tergite 2 wider than long (1.3) (Fig. 10), rugoso-punctate, with deeper and longer basolateral grooves (Fig. 10). Propodeum areolated and with a yellow mark, costula present, apical transverse carina strong and arched. Abdomen brown beyond tergite 2 in female and with narrow yellow apical margins (tergites 1-2 black with broader apical margins, Fig. 10). In male abdomen black with comparatively broader yellow apical margins. Taiwan..... 2. *phaeopyga* **sp.nov.**

1. ***Exenterus orientalis*** **sp. nov.**
(Figs. 1-8, 11)

Male and female: Head (Fig. 1) punctate except for clypeus. Clypeus subpolished, with scattered punctures in basal half, its apical half transversely impressed and coriaceous, its apical margin broadly rounded and reflexed. Malar space 0.25x the basal width of mandible (in male 0.28x), less than the width of first flagellar segment. Interocellar distance 0.71-0.75x the ocellocular distance (in male 0.8x). Temple in profile about 1.25x as wide as eye width. Thorax with distinct, well separated punctures, interspaces shiny. Mesoscutum and scutellum more shallowly punctate and more shiny (Fig. 2). In some specimens from Taiwan, mesoscutum a little more strongly punctate. Scutellum subconvex, its lateral carina confined at base. Epicnemial carina of uniform height ventrally, epicnemium without any projections behind fore coxae. Sternaulus indicated in anterior half. Propodeum convex, rugoso-punctate (Fig. 8), without carinae except sometimes traces of the apical transverse carina visible laterally. Areolet and costulae absent. In male apical transverse carina more prominent. Legs slender. Hind tarsus slightly longer than hind tibia (Fig. 11). Tarsal claws not pectinate. Nervellus

intercepted at its middle. Tergite 1 about 2.0x as long as wide, largely punctate to somewhat rugoso-punctate. Dorsomedian carinae not extending beyond the level of spiracles. Basolateral carina often indistinct beyond spiracles. These carinae comparatively weaker in male. Tergite 2 usually 1.2x as long as wide, but in males and some females, about as long as wide, rugoso-punctate to aciculopunctate (Fig. 3-4). Tergites 3-4 punctate. Punctures a little stronger on tergites 1-3 in specimens from Pakistan. Rest of the tergites with sparser and shallower punctures. Ovipositor short and thick, pointed apically, with teeth on both the lower and upper valves (Fig. 5, 7). Ovipositor sheaths broadly triangular. Female subgenital plate strongly sclerotized, convex, folded medially but not strongly creased, pointed apically (Fig. 5, 7). Male subgenital plate small, flat and rectangular.

Egg (as visible on the ovipositor, Fig. 7) about half the length of ovipositor and apparently with a double stalk.

Color: Black with yellow stripes. Face, clypeus, mandibles, malar space, lower part of cheek partly, and inner frontal orbits, yellow. Face with a broad black line continuous with black along epistomal groove. Thorax black with pronotal collar narrowly to widely, basolateral corners of pronotum (sometimes absent), scutellum, metascutellum, subtegular ridge, and often a mark on the front margin of mesopleurum, yellow. Specimens from Pakistan with comparatively large marks in the center of mesoscutum (Fig. 2). Some specimens from India with narrow lines in the middle of mesoscutum. Coxae, femora, and hind trochanters black, except fore and middle coxae often partly yellow, particularly in specimens from Taiwan. Fore and middle trochanters usually yellow, but with black marks in specimens from India, darker in the type. Fore and middle femora black with yellow marks ventrally and apically. Fore and middle tibiae and tarsi yellow or with light fuscous marks. Hind tibia black basally and on apical 0.4. Hind tarsus black. Abdominal tergites black with yellow apical bands on tergites 1-6. Bands variable (Figs. 3, 4, 6), short, narrow, or absent on tergites 3 and 5-6. Sometimes bands on tergites 1-2 also short. Ovipositor sheaths brown. Subgenital plate black. Sternites yellow with black lateral spots.

There is considerable color variations in specimens as described above.

Length: 8.0-9.5 mm.; fore wing 6.5-7.5 mm.; ovipositor about 0.8 mm.

Holotype: ♀, India: Himachal Pradesh: Dalhousie Hills: Diankund (=Dhenkund), 2743 m., near Dalhousie, 6.VI.1971, Coll. V. K. GUPTA (GUPTA).

Paratypes: 12 ♀♀ from India: Himachal Pradesh: Dalhousie Hills: Dalhousie, 2130 m., 1 ♀, 29.V.1971, GUPTA; Ahla catchment area, 2286 m., 2 ♀♀, 8.VI.1971 and 22.VIII.1971, GUPTA; Khajjiar, 1915 m., 1 ♀, 29.VI.1965, GUPTA; Banikhet, 1524 m., 2 ♂♂, 1.V.1971, Kamath. Pakistan: Battal, 1 ♀, 21.VI.1970, and Guriaz, 1 ♂, 16.VI.1970, CIE-A4167, ex pupa of "*Gilpmia*" sp. [=*Gilpinia* sp.] (BM, London). Taiwan: Tayuling, 2560 m., Hualin Hsien, 4 ♀♀, 9-16.VI.1980, K. S. LIN & B. H. CHEN (Tari, Wufeng).

Distribution: India (Himachal Pradesh), Pakistan, and Taiwan.

Host: *Gilpinia* sp. The specimens from Pakistan are labeled to have been reared from the pupae. However, the species of the genus are larval parasites which kill the host inside its own cocoon.

Affinities: *E. orientalis* does not appear related to any of the known species from other parts of the world. It keys close to the North American *E. pini* CUSHMAN and *E. canadensis* PROVANCHER in the key of CUSHMAN (1940) in general body color, body sculpture and in the nature of the propodeum. It is very different, however, in having

slender first and second abdominal tergites which are longer than wide, nervellus intercepted in the middle rather than below the middle, and the female subgenital plate folded medially and pointed apically. In *E. pini* and *E. canadensis*, the female subgenital plate is flat and not folded medially. The propodeum is shallowly punctate in the basomedial area in orientalis, while it is strongly punctate in *pini* and reticulate in *canadensis*. *E. canadensis* has the clypeus more strongly convex and the apical propodeal carinae are more apparent, though areola is not fully formed.

2. *Exenterus phaeopyga*. sp. nov.
(Figs. 9, 10)

Distinguished from *E. orientalis* in having a comparatively stout abdomen, with tergite 1 about 1.75x as long as its apical width, areolated propodeum, wider tergites 1 and 2 (Fig. 10), and apex of abdomen being brown in the female.

Female: Similar to *E. orientalis* except as follows: Clypeus a little convex, with scattered punctures in basal 0.6, impressed and coriaceous in apical 0.3. Apical margin of clypeus broadly truncate medially. Interocellar distance 0.85x the ocellocular distance (Fig. 9). Propodeum fully areolated, rugose to rugoso-punctate, areola wider than long, costula distinct, apical transverse carina strong and broadly arched. Abdomen comparatively stout. Tergite 1 1.75x its apical width, its dorsomedian carinae extending to 0.8 the length of tergite. Dorsolateral carina strong and extending to apex. Tergite 2 about 1.3x as wide as long, with deeper and longer basolateral grooves (Fig. 10). Tergites 1 and 2 rugoso-punctate. Tergites 3-4 punctate Fig. 10). Female subgenital plate, ovipositor, and egg similar to those in *E. orientalis*.

Color: Black with yellow marks and apical half of abdomen brown. Yellow marks on head and thorax similar to those in *E. orientalis* except that yellow mark along frontal orbits a little more extensive on frons close to lateral ocelli, pronotum with an additional yellow mark in the neck region, tegula yellow, mesopleurum with a yellow mark in front, propodeum with a yellow mark along apical transverse carina, wider laterally and narrower medially, and abdominal tergites 3-8 and ovipositor sheaths and ovipositor, brown. Tergites 1-2 with broad yellow apical bands (Fig. 10). Tergites 3-6 with faint narrow yellow bands. Female subgenital plate blackish-brown. Sternites yellow with lateral black spots. Leg coloration generally similar to that of *E. orientalis*, but fore and middle coxae and femora largely yellow, all trochanters yellow, and fore and middle tibiae and tarsi largely yellow, only slightly fuscous apically.

Male: Similar to the female except as follows: Interocellar distance 1.0x the ocellocular distance. Tergite 1 strongly rugose, its dorsomedian and dorsolateral carinae strong and extending to apex of the tergite. Tergite 2 rugose with aciculations in the middle. Tergites 3-4 more strongly punctate than in the female.

Color: More blackish than the female. Tegula largely black. Abdomen black with yellow apical bands on tergites 1-6, bands wider than in the female.

Length: 9-10 mm.; fore wing 6.6-7.5 mm; ovipositor about 0.8 mm.

Holotype: ♀, Taiwan: Wushe, 1150 m., 3.V.1983, H. TOWNES (AEI, Gainesville).

Paratypes: Taiwan: Kuandouchi, 1 ♂, 12-15.X.1970, Malaise trap; 1 ♀, 30.III.1971, Malaise trap (TARI, WUFENG).

Distribution: Taiwan.

Etymology: The name of this species is derived from the Greek phaios = brown + pyge, referring to the tip of the abdomen.

Affinities: *E. phaeopyga* belongs to the *amictorius*-group of species having an areolated propodeum. It differs from *E. amictorius* (PANZER) and *claripennis* THOMSON in having normal fore coxal cavities, the margins of which are not raised like keels. Its subgenital plate is folded medially but not creased as in *E. adspersus* HARTIG and *tricolor* ROMAN. It resembles somewhat *E. confusus* KERRICH, but there are differences in coloration, curvature of the subgenital plate, and angulation of nervellus.

KERRICH stated that the margins of the fore coxal cavities are raised in *E. claripennis*, but this is not seen in the specimens at hand. The epicnemial carina is uniformly arched ventrally in both *E. claripennis* and *E. phaeopyga*.

Acknowledgments

I thank Drs. Henry TOWNES, W. R. M. MASON, and Paul M. MARSH for reading the draft of the manuscript and offering valuable suggestions.

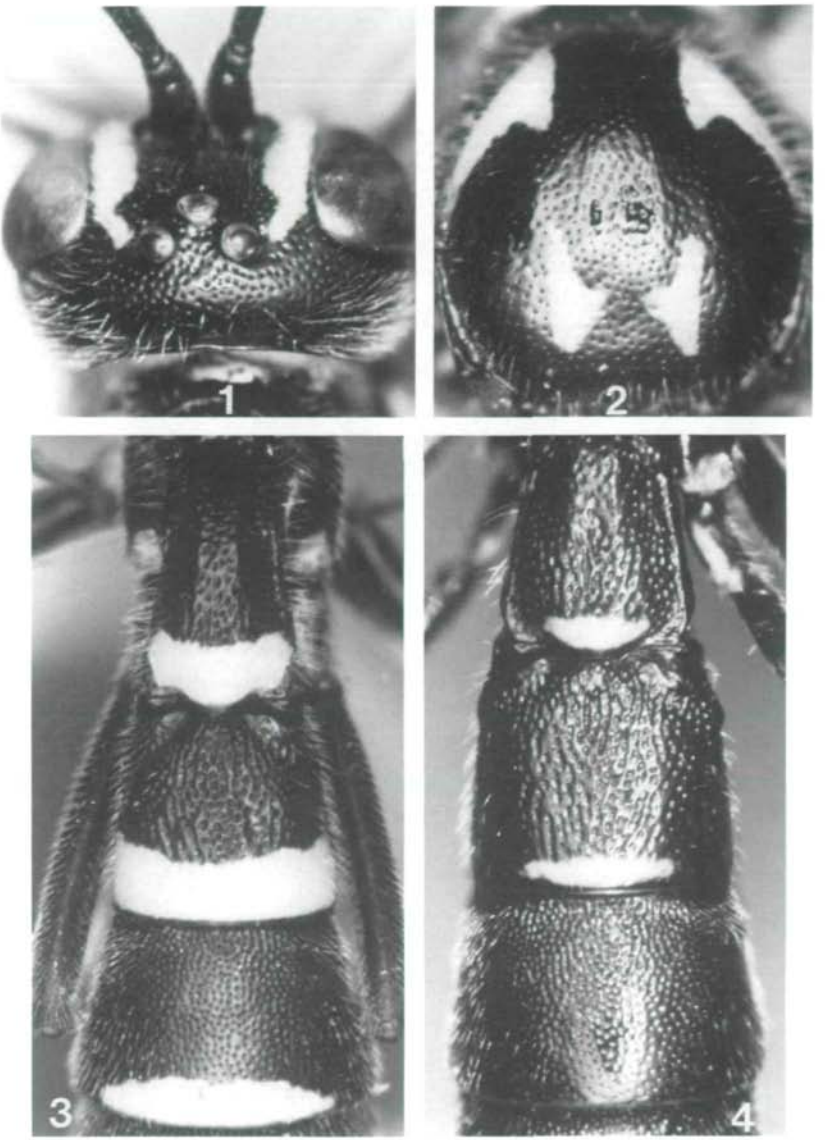


Plate I, Figs. 1- 4. *Exenterus orientalis* sp.nov., ♀: 1, vertex; 2, mesoscutum (Pakistan specimen); 3- 4, tergites 1-3. (Figs. 1-3 of paratype from Pakistan; 4 of paratype from India).

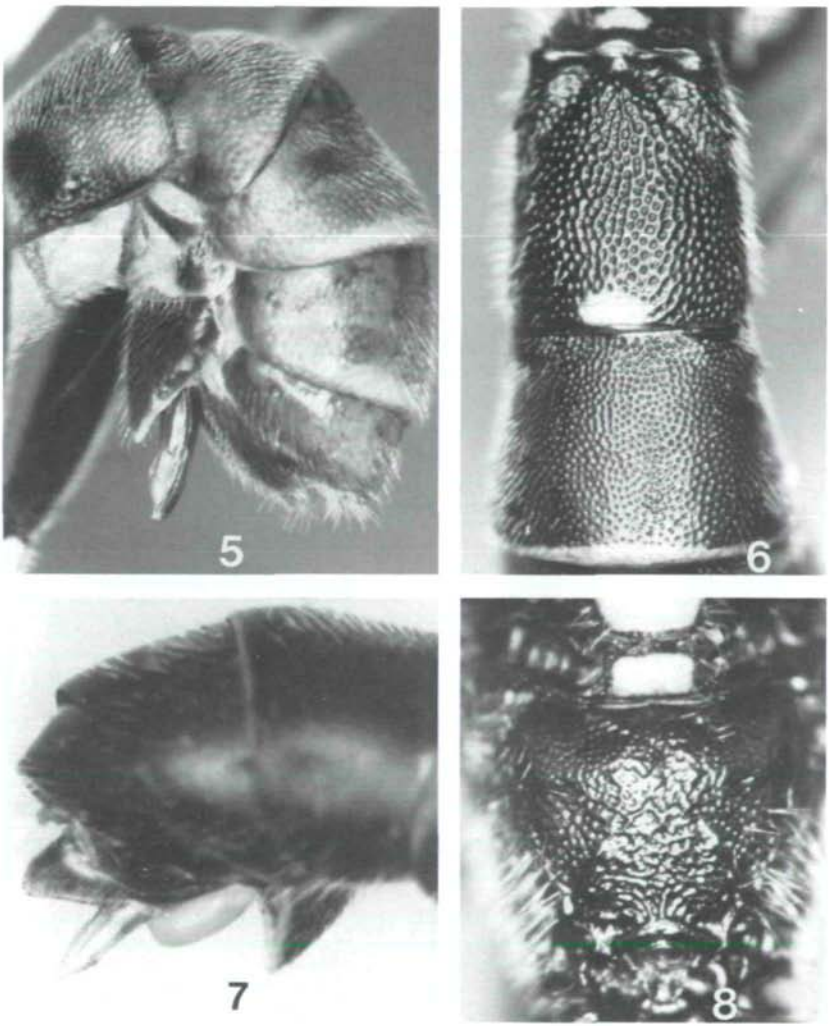
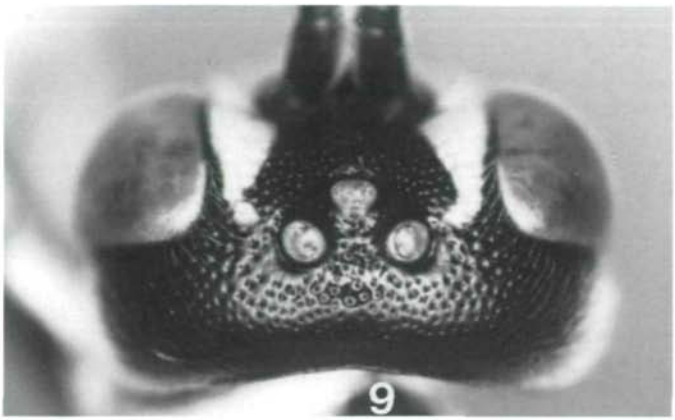
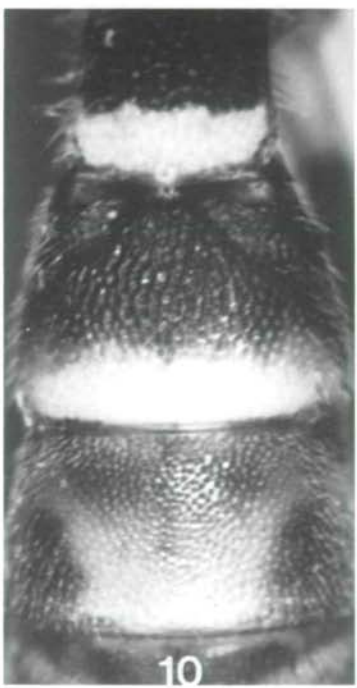


Plate II, Figs. 5-8. *Exenterus orientalis* sp. nov. ♀: 5, apex of abdomen and ovipositor; 6, tergites 2-3; 7, ovipositor with egg; 8, propodeum. (Figs. 5-7 of paratype from Taiwan; 8 of paratype from India).





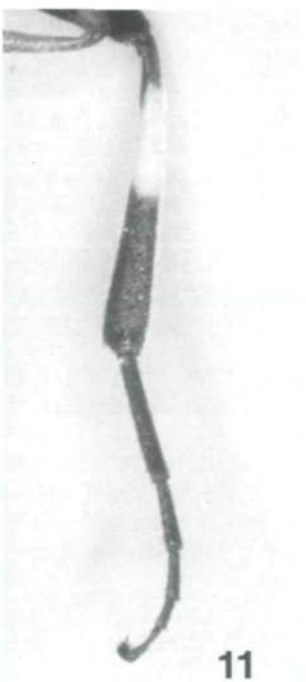


Plate III, Figs. 9-10. *Exenterus phaeopyga* sp. nov. ♀: 9, vertex; 10, tergites 1-3 (paratype from Taiwan). Fig. 11. *E. orientalis*, hind tibia and tarsus of paratype from Taiwan.

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Author's adress:
Dr. V. K. GUPTA
The University of Florida
Institute of Food and Agricultural Sciences
BLDG. 970, Hull Road
Gainesville, Florida 32611-0740, USA

Literaturbesprechung

SCHAEFER, M. - 1992. Wörterbücher der Biologie. Ökologie. - Gustav Fischer Vlg., Jena, UTB 430, 3. überarbeitete und erweiterte Auflage, 433 pp., Paperback.

Mit der nach wie vor steigenden Bearbeitungsintensität unterschiedlichster ökologischer Fragestellungen luxuriert die Fülle fachspezifischer Termini. Bereits im Vorwort zu diesem Wörterbuch vermerkt SCHAEFER, "daß die Ökologie eine Wissenschaft ist, in der sich manche Forscher in der Prägung von Begriffen ausgetobt haben". Ein umfassender Überblick über das ökologische Vokabular ist heute wahrscheinlich nur noch wenigen Personen vorbehalten. An diesem Punkt setzt das "Wörterbuch der Biologie. - Ökologie" mit Erfolg an.

Die Mehrheit der ausgewählten Stichwörter des Wörterbuches kommt aus dem Kernbereich der Ökologie, nämlich der Botanik, der Zoologie und der Mikrobiologie. Weiterhin gehen zahlreiche Begriffe aus der theoretischen, angewandten und mathematischen Ökologie, sowie aus der Bodenkunde ein.

Wichtige Originalaufsätze werden heute fast ausschließlich englisch publiziert. Die Voraussetzung zu ihrem Verständnis ist die Kenntnis des anglo-amerikanischen Wortschatzes. In diesem Zusammenhang bietet das Wörterbuch sowohl die englisch-deutsche als auch die deutsch-englische Übersetzung der Termini an.

Leider wurde dieses Buch nur sehr sparsam illustriert. Weitere erklärende Abbildungen könnten sehr zum Verständnis einzelner Begriffe beitragen.

In der Regel steht ein Biologiestudent am Beginn seines Studiums vor einem riesigen Berg "Vokabeln", die er im Laufe der Semester als "Sprache der Biologie" erlernen muß. Das "Wörterbuch der Biologie. - Ökologie" bietet die wertvolle Möglichkeit, mit Hilfe prägnanter Begriffsdefinitionen zu einem Verständnis ökologischer Terminologien und der damit beschriebenen Zusammenhänge zu gelangen.

S. M. BLANK

WATERHOUSE, D.F. et al. (eds.): The Insects of Australia. A textbook for students and research workers. Vol. 2. - Melbourne University Press, Carlton, 1991 (2. Auflage). 595 S.

Die zweite Auflage dieses Standarwerkes über die mehr als 85.000 Arten enthaltende australische Insektenfauna hat zahlreiche Neuerungen und Veränderungen erhalten, so daß eine Ausweitung auf zwei Bände unausweichlich wurde. Während der erste Band die ausführlichen allgemeinen Kapitel und die Ordnungen Collembola bis Neuroptera vorstellt, enthält der zweite Band die noch fehlenden Ordnungen Coleoptera, Strepsiptera, Mecoptera, Siphonaptera, Diptera, Trichoptera, Lepidoptera und Hymenoptera. Am Ende des zweiten Bandes finden sich auch Literaturverzeichnis und Index dieses 1137 Seiten starken Standardwerkes über die Insekten Australiens. Besonders interessant sind dabei die Bearbeitungen der Käfer und Köcherfliegen, da hier auch für die Larven Familien-Bestimmungsschlüssel vorliegen. Ansonsten beinhalten die Beschreibungen der einzelnen Ordnungen eine ausführliche Behandlung von Morphologie, Anatomie, Entwicklung, Biologie, Verhalten, Reproduktion, Natürliche Feinde und wirtschaftlicher Bedeutung. Zahlreiche SW-Zeichnungen und REM-Aufnahmen illustrieren auch diesen zweiten Band hervorragend.

Jeder entomologisch Interessierte, ob Laie oder Fachwissenschaftler, wird gerne auf dieses Werk zurückgreifen, welches weit über die australische Fauna hinaus Allgemeingültigkeit erreicht.

R. GERSTMEIER

SCOBLE, M.J.: The Lepidoptera. - Oxford University Press, Oxford, 1992. 404 S.

Man könnte meinen, daß über eine so populäre Insektengruppe wie die Schmetterlinge zahlreiche Fachliteratur vorliegt. Will man sich einen umfassenden Überblick über die gesamte Ordnung verschaffen, so stellt man sehr schnell fest, daß sich die Literatur auf sehr wenige Gruppen oder nur auf einzelne Länder beschränkt. Aufgeteilt in drei große Kapitel (allgemeine Morphologie, Physiologie und Fortpflanzung; ökologische Bedeutung; Beschreibung der Hauptgruppen) bietet dieses Buch tatsächlich einen weitreichenden Überblick über die Schmetterlings-Familien der Welt. SW- und REM-Illustrationen beschränken sich auf das 1. Kapitel, welches zusätzlich auch 4 Farbtafeln enthält. Für Kapitel 3 sind einzelne Vertreter verschiedenster Familien in 17 SW-Tafeln zusammengestellt. Berücksichtigt man, daß die beiden letzten Standardwerke dieser Art (ZERNY & BEIER 1936, BOURGOGNE 1951) doch schon einige Zeit zurückliegen, kann dieses Buch als neues Standardwerk nur wärmstens empfohlen werden; eine Übersetzung ins Deutsche würde sich lohnen.

R. GERSTMEIER

AMIN, M., WILLETTS, D., MARHALL, P.: Reise durch die Malediven. - Landbuch-Verlag, Hannover, 1992. 192 S.

Daß die über 1000 Inseln der Malediven mehr zu bieten haben als "nur" Wassersport und Sonnenbräune, versucht das bereits wohl bekannte Autoren- und Fotografen-Erfolgstrio zu vermitteln. Es berichtet über die einzigartige Sprache und die uralte Kultur der Malediver und man wäre versucht dieses Buch als Reiseführer mit in den Urlaub zu nehmen, wenn es sich nicht um einen großformatigen Bildband handeln würde. Neben Atollen, traumhaften Sandstränden und brillianten Unterwaseraufnahmen, sind es vor allem die eindrucksvollen und einfühlsamen Fotos über die Menschen und ihre Kultur (und die gibt es tatsächlich in Hülle und Fülle), die ein lebendiges Bild der Malediven vermitteln und dieses Buch zu einem Bildband der Extraklasse machen.

R. GERSTMEIER

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Wolfgang Schacht, Scherrerstraße 8, D - 8081 Schöngeising.
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