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A review of *Eremiaspecium* Kohl, 1897 (Hymenoptera: Sphecidae)

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Abstract

Diagnostic and other taxonomically important characters of *Eremiaspecium* are discussed. *Taukumia* KAZENAS, 1991, is synonymized with *Eremiaspecium* KOHL, 1897. A new species, *Eremiaspecium arabicum* sp. nov., is described from El Riyadh, Saudi Arabia. *Eremiaspecium digitatum* (GUSSAKOVSKIJ, 1930), previously known from Kazakhstan and Turkmenistan, is first recorded from Mauritania, and *Eremiaspecium schmiedeknechtii*, KOHL, 1897, first recorded from the Arabian Peninsula. A catalog of all described species is provided with full bibliographic and distributional records.

Introduction

Eremiaspecium is a little known genus that occurs in hot, dry areas from Mauritania and Canary Islands to Mongolia. Specimens are rarely collected, recognition features are not well known, and the original description has been ignored. As a result, four generic names were proposed for the eight species recognized so far. Relationships of *Eremiaspecium* to other Sphecidae are still controversial because of an unusual combination of characters (BOHART and MENKE, 1976; ALEXANDER, 1990, 1992a, b). Because of scarcity of available

material, ALEXANDER (1992b) assigned some character states to the whole genus, whereas in fact they are found only in some but not all species. MARSHAKOV (1976) synonymized some of the previously described species, described one new species, and provided an updated key to species identification.

In this paper, I discuss recognition characters and taxonomically important characters of the genus, correct some inaccuracies of previous authors, establish a new generic synonymy, describe a new species from Saudi Arabia, and add new faunal records. I append a catalog of species with full bibliographic and distributional data, reflecting the species and synonymies not included in BOHART and MENKE (1976). I have seen a total of 26 specimens representing seven species (*arabicum*, *budrysi*, *crassicorne*, *desertorum*, *digitatum*, *longiceps*, and *schmiedeknechtii*).

The following abbreviations are used for institutions in which types or voucher specimens are preserved:

CAS: California Academy of Sciences, San Francisco, California, USA

NHMW: Naturhistorisches Museum, Wien, Austria

TMB: Természettudományi Múzeum, Budapest, Hungary

ZIN: Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Eremiasphecium KOHL, 1897

Eremiasphecium KOHL, 1897:67. Type species: *Eremiasphecium schmiedeknechtii* KOHL, 1897, by monotypy.

Shestakovia GUSSAKOVSKU, 1930:275. Type species: *Shestakovia digitata* GUSSAKOVSKU, 1930, by original designation. Synonymized with *Eremiasphecium* by PATE, 1935:249.

Mongolia TSUNEKI, 1972:230. Type species: *Mongolia steppicola* TSUNEKI, 1972, by original designation and monotypy. Synonymized with *Eremiasphecium* by KAZENAS, 1974:1733 and also by MENKE and PULAWSKI in BOHART and MENKE, 1976:54.

Taukumia KAZENAS, 1991:156. Type species: *Taukumia budrysi* KAZENAS, 1991:158, by original designation and monotypy. Syn. nov.

Status of *Taukumia*. - My study of a specimen of *Taukumia budrysi*, the unique included species, indicates that the genus is a synonym of *Eremiasphecium*. Unlike its congeners, *budrysi* has a largely open discoidal cell II, but I consider this to be a specific rather than a generic character. KAZENAS himself noted the similarity between *Taukumia* and *Eremiasphecium* when he stated "*Taukumia* probably represents the link between Pemphredoninae and Philanthinae through the tribes Ammoplanina and Eremiasphecini."

Diagnosis. - *Eremiasphecium* is easily recognized by its unique wing venation: marginal cell short (costal margin shorter than pterostigma); and three submarginal cells present, cell II receiving no recurrent vein, cell III as wide anteriorly as posteriorly or narrowing posterad (petiolate posteriorly in some species). Other recognition features are: propodeal spiracle separated from propodeal base by about twice its length; female clypeus broadly, shallowly emarginate mesally and labrum exposed; female forebasitarsus expanded apicolaterally in a projection; and female tergum VI flattened, with poorly defined pygidial plate.

Corrections to Previous Descriptions. - TSUNEKI (1972, Figure 140) represented the mandible of *ornatum* (his *steppicola*) as having a broad preapical tooth, but the plain inner margin was correctly illustrated by BOHART and MENKE (1976) who examined the holotype of *steppicola*. These authors, on the other hand, overlooked the 6+4 palpal formula in the original description of *schmiedeknechtii* (KOHL, 1897). They studied a syntype female of *schmiedeknechtii* and found the formula to be 5+3. My study of another syntype female confirms KOHL's description, although the formula is 5+3 in the two conspecific males examined. Obviously, the number of palpomeres varies in *schmiedeknechtii*, 6+4 being the ancestral state. According to MARSHAKOV (1976), the antennal socket of *ornatum* is removed from the frontoclypeal suture by its own diameter, although his Figure 119 shows a shorter distance. This is contrary to GUSSAKOVSKIJ's original description of *Shestakovia* ("antennis in margine clypei insertis"). If really so, the antennal socket contacting the frontoclypeal suture is not a universal generic character of *Eremiasphecium*, as thought previously. On the other hand, MARSHAKOV synonymized *steppicola* with *ornatum*, although the antennal socket of *steppicola* does contact the frontoclypeal suture. Clearly his description and the synonymy need verification. ALEXANDER (1992a) attributed long, conspicuous notauli to *Eremiasphecium*. Notauli are indeed long in most species, but they are fine, inconspicuous, and absent in *arabicum*, *budrysi*, and *digitatum*. ALEXANDER (1992b, data matrix) also thought that the postspiracular carina of *desertorum* and *schmiedeknechtii* was sharp, but the carina appeared obtuse to me from most angles. The carina is clearly obtuse in *digitatum* and absent in *arabicum* and *budrysi*. I could not find the subalar line he observed.

Characteristics of *Eremiasphecium*. - BOHART and MENKE (1976) provided a modern description of the genus, and ALEXANDER'S (1992b) data matrix includes several characters not considered by these authors. KAZENAS (1991) first observed nesting and prey.

The following unused or imprecisely described characters should be considered in future studies of the genus, either at the generic or specific level.

Occipital carina reduced to mesodorsal remnant. Hypostomal carina present (*arabicum*), evanescent (*longiceps*), present posteriorly and absent anteriorly (*schmiedeknechtii*), or absent. Palpal formula 5+3 in most species, but 6+4 or 5+3 in *schmiedeknechtii*. Pronotum without anterodorsal transverse pit or groove. Scrobal sulcus well defined (most species) or evanescent (some *longiceps*). Propodeum large: midlength of dorsum equal to about 0.5 of basal width; enclosure poorly defined or absent; spiracle separated from propodeal base by about twice its length. Jugal excision deep, anal excision present. Tergum I with no oblique basal carinae. Cephalic and thoracic setae very short, inconspicuous, entire propodeum asetose. Female: clypeal free margin broadly, shallowly emarginate corner to corner (corner angulate); tergum VI flat, lateral margin of pygidial plate obtuse (hence plate poorly defined), close to tergal margin and subparallel to it. Male sternum VIII narrowly pointed apically.

Life History. - The only biological information for *Eremiasphecium* was provided by KAZENAS (1991). His new species, *budrysi*, nests in the ground and preys upon Thysanoptera.

Relationships. - In the past, *Eremiasphecium* has been assigned to Philanthinae (KOHL, 1897; de BEAUMONT, 1949, 1968; MENKE, 1967; BOHART and MENKE, 1976; MARSHAKOV, 1976), to Larrinae (GUSSAKOVSKIJ, 1930), or to Pemphredoninae (TSUNEKI, 1972; KAZENAS, 1991). ALEXANDER'S cladistic analyses (1990, 1992a, b) demonstrate that none of these placements are well supported, but his own results are inconclusive. Putative relationships of *Eremiasphecium* varied with assumptions and methods used in his analyses: equal or successive weighting for all characters, polarities based or not based on optimizations. Clearly, the relationships of the genus cannot be resolved based on the currently known synapomorphies of the sphecid tribes. One obviously derived character of *Eremiasphecium* not considered by ALEXANDER (1992b), the thysanopteran prey, is also found in the subtribe Ammoplanina: *Ammoplanus*, *Pulverro*, *Spilomena*, and *Xysma* (references to prey were summarized by BOHART and MENKE, 1976, and one overlooked source is AHRENS, 1948). Sharing the thysanopteran prey may be an indication of a relationship, but in my opinion this is only a reflection of the wasps' small size (body length of *Eremiasphecium* ranges from 1.0 to 4.5 mm), in other words a parallelism. The absence of cerci and submarginal cell III in Ammoplanina (a derived condition) and their presence in *Eremiasphecium* demonstrate that they are not closely related.

***Eremiasphecium budrysi* (KAZENAS, 1991), new combination**

KAZENAS (1991) described the wing of *budrysi* as having only one discoidal cell, but in reality a widely open second cell is also present: the recurrent vein II is preserved anteriorly and the apical abscissa of the cubital vein is also present. Both rudiments were illustrated by KAZENAS, and they are also visible in the specimen that I have examined. Discoidal cell II is complete (closed) in all other *Eremiasphecium*.

Eremiasphecium budrysi was described from two females collected 20 km N of the village Aydarly in the Sarytaukum Desert, southeastern Kazakhstan. I collected another female at Kapchagai, 75 km N Alma-Ata, 14 July 1976 (CAS).

***Eremiasphecium digitatum* (GUSSAKOVSKIJ, 1930)**

Eremiasphecium digitatum, originally described from Turkmenistan and subsequently recorded from Kazakhstan (MARSHAKOV, 1976), was discovered in Nouakchott, Mauritania, by Alessandro MOCHI on 27 October 1989 (1 female, 1 male, his collection; 1 female, CAS). The species is easily recognized by its transverse head and conspicuously long forebasitarsal process. Except for a few details of coloration, the Mauritanian specimens fully agree with the original description and MARSHAKOV'S (1976) redescription.

***Eremiasphecium schmiedeknechtii* KOHL, 1897**

First described from Egypt and then (as *bicolor* GUSSAKOVSKIJ) from Turkmenistan, subsequently recorded from Gran Canaria, Canary Islands. I have seen specimens from Oman: Wahiba Sands, 21°56'N, 58°55'E (2 males, CAS). They agree well with de BEAUMONT'S (1968) redescription and MARSHAKOV'S (1976) key characters, including the notch on flagellomere VII. The notch was mentioned by de BEAUMONT, but not noted by MARSHAKOV.

***Eremiasphecium arabicum* Pulawski, sp. nov.**

Name Derivation. - Arabicum, a Latin neuter adjective meaning Arabic; with reference to the country of origin.

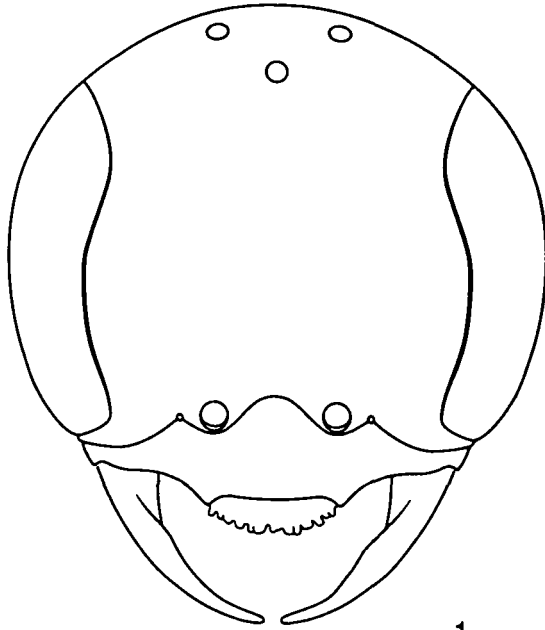
Diagnostic Characters. - *Eremiasphecium arabicum* and *budrysi* differ from other species by the following combination of characters: submarginal cell II petiolate, submarginal cell III not narrowing posterad, marginal cell relatively long (costal margin about 0.75 x length of pterostigma), and body predominantly black.

Unlike *budrysi*, recurrent vein II is complete in *arabicum* (thus discoidal cell II is closed), the hypostomal carina is present, and the integument around the oral fossa is not concave. In *budrysi*, the recurrent vein II is largely reduced, the discoidal cell II is largely open, the hypostomal carina is absent, and the integument is broadly, shallowly concave around the oral fossa. The venation of *longiceps* is similar to that of *arabicum* and *budrysi*, but its head is markedly elongate rather than rounded, and the body is predominantly yellow.

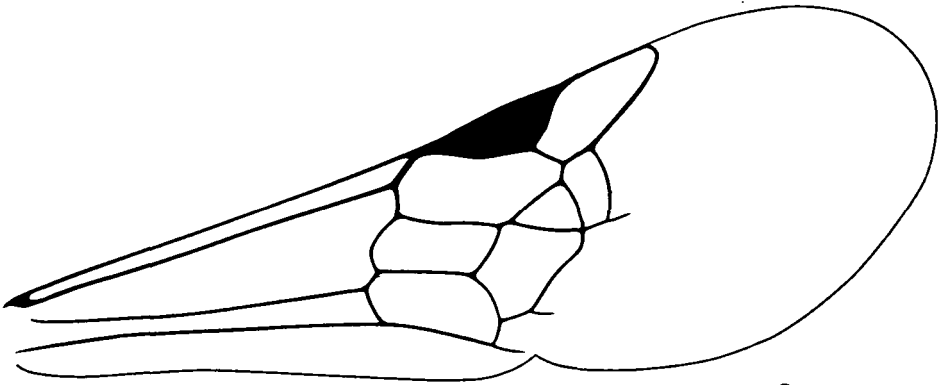
Description. - Head round in front view (Fig. 1). Free margin of labrum asymmetrically denticulate. Free margin of clypeal lobe broadly emarginate, lobe corner well defined. Free margin of labrum arcuate, not emarginate. Distance between hindocelli about 0.83 x distance between hindocellus and orbit. Flagellomeres I-VII shorter than wide, length of flagellomere II about 0.5 x width; apical flagellomere markedly longer than wide basally. Pronotal collar transverse (unlike *longiceps*, in which the collar is elongate). Propodeal dorsum uniformly microareolate, areolae evanescent laterally and posteriorly. Forewing (Fig. 2): marginal cell acuminate, elongate (costal margin about 0.75 x length of pterostigma); submarginal cell II petiolate (petiole length about 0.5 x cell's height); submarginal cell III about as wide anteriorly as posteriorly; discoidal cell II closed. Forebasitarsus somewhat prominent apicolaterally, prominence about equal to basitarsus width. Body length 2.8 mm

Head, thorax, and gaster black, but the following are pale yellow: clypeal lateral section, mandible (except apically), tegula, and humeral plate; antenna brown dorsally, pale yellow ventrally (scape largely dark brown); wing venation light brown, pale yellow basally (pterostigma dark brown posteriorly). Femora black, pale yellow apically; tibiae and tarsi pale yellow.

Material Examined. - Holotype: female, Saudi Arabia, El Riyadh, 14 June 1959, Dr. DIEHL collector (CAS).



1



2

Figures 1 - 2: *Eremiasphecium arabicum*, female: 1, head in front view (in the actual specimen, the labrum is inclined obliquely posterad, and the teeth are not visible in the frontal view); 2, forewing.

Catalog of *Eremiasphecium*

arabicum PULAWSKI, sp. nov. - Saudi Arabia.

budrysi (KAZENAS) - Kazakhstan.

Taukumia budrysi KAZENAS, 1991:158, female. Holotype: female, Kazakhstan: Sarytaukum Desert: 20 km N Aydarly (ZIN). Comb. nov.

crassicorne (GUSSAKOVSKIJ) - Kazakhstan, Turkmenistan, Mongolia.

Shestakovia crassicornis GUSSAKOVSKU, 1930:282, female, male. Lectotype: female, Turkmenistan: Uch-Adzhi (ZIN), designated by MARSHAKOV, 1976:674 (additional description; Turkmenistan, Kazakhstan; Mongolia). - In *Eremiasphecium*: BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:673 (additional description).

Eremiasphecium dzhanokmenae KAZENAS, 1974:1734, male. Holotype: male, Kazakhstan, 10 km W Alma-Ata (ZIN). Synonymized with *Eremiasphecium crassicorne* by MARSHAKOV, 1976:674. - BOHART and MENKE, 1976:629 (listed).

desertorum (GUSSAKOVSKIJ) - Turkmenistan.

Shestakovia desertorum GUSSAKOVSKU, 1930:280, female, male. Lectotype: female, Turkmenistan: Uch-Adzhi (ZIN), designated by MARSHAKOV, 1976:674. - In *Eremiasphecium*: BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:674 (references, illustration).

digitatum (GUSSAKOVSKIJ) - Mauritania, Kazakhstan, Turkmenistan.

Shestakovia digitata GUSSAKOVSKU, 1930:278, female, male. Lectotype: female, Turkmenistan: Uch-Adzhi (ZIN), designated by MARSHAKOV, 1976:674. - In *Eremiasphecium*: BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:674 (references, illustrations).

longiceps (GUSSAKOVSKIJ) - Turkmenistan, Mongolia.

Shestakovia longiceps GUSSAKOVSKU, 1930:284, female, male. Lectotype: female, Turkmenistan: Uch-Adzhi (ZIN), designated by MARSHAKOV, 1976:672. - In *Eremiasphecium*: BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:672 (additional description; Turkmenistan, Mongolia).

mollakarum MARSHAKOV - Turkmenistan.

Eremiasphecium mollakarum MARSHAKOV, 1976:674, female. Holotype: female, Turkmenistan: Mollakara near Dzhebel (ZIN).

ornatum (GUSSAKOVSKIJ) - Turkmenistan, Mongolia, Kazakhstan.

Shestakovia ornata GUSSAKOVSKU, 1930:283, male. Holotype: male, Turkmenistan: Farab

- (ZIN). - In *Eremiasphecium*: BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:672 (additional description; Turkmenistan, Mongolia).
- Mongolia steppicola* Tsuneki, 1972:230, female. Holotype: female, Mongolia, South Gobi Aymag: 100 km W Ovot Khuural (TMB). Synonymized with *Eremiasphecium ornatum* by MARSHAKOV, 1976:672. - BOHART and MENKE, 1976:561 (listed).
- Eremiasphecium gussakovskii* Kazenas, 1974:1735, male. Holotype: male, Kazakhstan: Ili River valley 15 km E Aiak-Kalkan (ZIN). Synonymized with *Eremiasphecium ornatum* by MARSHAKOV, 1976:672. - BOHART and MENKE, 1976:629 (listed).
- schmiedeknechtii* KOHL - Canary Islands, Egypt, Arabian Peninsula, Turkmenistan.
- Eremiasphecium Schmiedeknechtii* KOHL, 1897:69, female, male, incorrect original capitalization. Syntypes: Egypt: Adelen Island on Nile opposite Dahshur (NHMW). - de BEAUMONT, 1968:256 (Canary Islands: Gran Canaria; additional description); PULAWSKI, 1965:576 (synonymy); BOHART and MENKE, 1976:561 (listed); MARSHAKOV, 1976:674 (additional description, illustration).
- Shestakovia bicolor* GUSSAKOVSKU, 1930:281, male. Holotype: male, Turkmenistan: Uch-Adzhi (ZIN). Synonymized with *Eremiasphecium schmiedeknechtii* by PULAWSKI, 1965:576.

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Literaturbesprechung

WAGNER, M.R. et al.: Forest entomology in West Tropical Africa: Forest insects of Ghana. - Kluwer Academic Publishers, Dordrecht-Boston-London, 1991. 210 S.

Dieser Band aus der Reihe "Series Entomologica" behandelt als erstes zusammenhängendes Buch die produktionschädlichen Forstinsektenfauna Westafrikas, wobei der Schwerpunkt auf Ghana liegt. Im ersten Kapitel werden allgemeine Aspekte der Wälder Ghanas diskutiert. Die weiteren Kapitel stellen, geordnet nach blattfressenden, saftsaugenden, holzbohrenden, blüten-, frucht- und samenfressenden, lagerschädlichen Insekten sowie Termiten, die eigentlichen Schädlinge vor. Fotos und Zeichnungen der Insekten und ihrer Schadbilder in Schwarz-Weiß illustrieren den Text. Im Anhang finden sich ein Glossar, eine Tabelle der Waldbaum-Arten Ghana's und eine Tabelle der bisher in Ghana nachgewiesenen Termitenarten.

Ein für praktizierende Förster und Forstentomologen wichtiges Nachschlagewerk, das auch über die Grenzen Ghana's hinaus große Beachtung finden wird.

R. GERSTMEIER

REDFORD, K.H., EISENBERG, J.F.: Mammals of the Neotropics. The Southern Cone. Vol. 2. - The University of Chicago Press, Chicago-London, 1992. 430 S.

Mit Chile, Argentinien, Uruguay und Paraguay werden die südlichen Länder der Neotropis in diesem 2. Band der "Mammals of the Neotropics" behandelt. Nach einer kurzen Einführung in die Biogeographie dieser Region folgt die Besprechung der etwa 360 Arten nach der zoologischen Systematik geordnet. Eine kurze Beschreibung informiert über Körpermaße und wichtige Bestimmungsmerkmale, die Angaben zu Verbreitung und Habitat werden durch Verbreitungskarten ergänzt und die Angaben zur Biologie fallen entsprechend dem aktuellen Wissensstand kürzer oder länger aus. Zusätzliche Strichzeichnungen von Schädeln, Zähnen und anderen Bestimmungsmerkmalen erleichtern die Determination. Jedes Kapitel (Ordnung) endet mit einer ausführlich zitierten und erfreulich aktuellen Literatur. 10 SW- und 8 Farbtafeln bringen Zeichnungen von fast 150 Arten. Das Material zu diesem Buch stammt im wesentlichen aus Literaturauswertungen und unpublizierten Museumsnachweisen; auf taxonomische Unstimmigkeiten wird lediglich hingewiesen. Erstmalig liegt somit ein umfassendes Nachschlagewerk zur südamerikanischen Säugetierfauna vor, welche durch einen noch erscheinenden 3. Band abschließend behandelt wird.

R. GERSTMEIER

MARCELLUS, T.: F & A 4.0. Grundlagen und Praxis. - te-wi Verlag, München, 1992. 880 S., 1 Beispieldiskete.

F & A ist ein integriertes Programmpaket, das eine mit vielen Funktionen ausgestattete Textverarbeitung in Kombination mit einer Datenbank und Funktionen zum Erstellen von Listen umfaßt. Der formularorientierte Datenbankteil ist sehr gut für jegliche Geschäftsführung geeignet, sei es die Verwaltung von Personal-, Versicherungs- und Gehaltsdaten, Listen von Lieferanten, Kunden etc. Somit ist F & A auch ein ideales Programm für die Verwaltung von Vereinen (Mitgliederdatei, Beiträge, Rechnungen, Mahnungen, Briefe, Etikettendruck etc.). Das F & A 4.0 Buch ist ein kompaktes Anleitungs-, Arbeits- und Nachschlagewerk, welches die Belange aller Anwendergruppen berücksichtigt. Nach ausführlicher Beschreibung der Installation werden die Module Text, Datei, Listen und der "Intelligente Assistent" behandelt. Ausführlich und anschaulich wird die Arbeit mit Makros, Hilfsprogrammen, Power-Tools und im Netzwerk erklärt. Manche Teilkapitel (z.B. Etiketten) hätten allerdings eingehender besprochen werden können.

Insgesamt ein empfehlenswertes Nachschlagewerk zum gleichnamigen Programm.

R. GERSTMEIER

RANDALL, J.E.: Diver's Guide to Fishes of Maldives. - Immel Publishing, London, 1992. 193 S.

In der wissenschaftlichen Literatur sind 387 Fischarten aus dem Gebiet der Malediven bekannt, mit etwa 700 muß gerechnet werden; 400 der häufigeren Arten werden in diesem Buch farbig abgebildet. Die Fischfamilien werden nach dem phylogenetischen Prinzip behandelt, die Gattungen und Arten sind dann alphabetisch geordnet. Die Fische wurden nach Entnahme aus dem Meer nach einem speziellen Verfahren des Autors fotografiert. Längenangabe, Kurzbeschreibung der Geschlechter sowie Angaben zur Biologie beschränken sich auf durchschnittlich 3 - 4 Zeilen pro Farbfoto. Es handelt sich also um ein kompaktes Identifikationswerk ohne große Textangaben und ohne weiterführender Literatur. Für den schnorchelnden oder tauchenden Nichtbiologen erfüllt es somit in bester Weise seinen Zweck.

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