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Mantidflies from Egypt with a redescription of *Afromantispa nana* (ERICHSON, 1839) (Neuroptera: Mantispidae)

Hayam EL HAMOULY & Rabab F. SAWABY

Abstract

Of the Mantispidae, three species in two genera, *Afromantispa nana* (ERICHSON 1839), *Nampista auriventris* (GUERIN-MENEVILLE 1838) and *Nampista ragaziana* (NAVÁS 1929), were recorded from the Egyptian fauna. During the present study *Afromantispa* SNYMAN & OHL 2012 was recorded for the first time in Egypt from Wadi El Lega South Sinai, also male genitalia was dissected and photographed for the first time.

Keys to genera and species, distributional data, synonyms and diagnoses accompanied with figures were included.

Key words: Lacewings, Mantispinae, *Nampista*, New record, Egypt.

Zusammenfassung

Von den Mantispidae wurden drei Arten in zwei Gattungen, *Afromantispa nana* (ERICHSON 1839), *Nampista auriventris* (GUERIN-MENEVILLE 1838) und *Nampista ragaziana* (NAVÁS 1929), aus der ägyptischen Fauna registriert. In der vorliegenden Studie wurde *Afromantispa* SNYMAN & OHL 2012 erstmals in Ägypten aus Wadi El Lega Süd-Sinai aufgenommen, auch männliche Genetalien wurden erstmals seziiert und fotografiert.

Schlüssel zu Gattungen und Arten, Verteilungsdaten, Synonyme und Diagnosen, die mit Abbildungen begleitet wurden, sind eingeschlossen.

Introduction

Mantidflies (Neuroptera: Mantispidae) are mantid-like, small to moderate in size, 5–47 mm long and with a wingspan of 5–30 mm; coloration range from brownish to green, yellow and sometimes red hues; the head is triangular with large eyes, the antennae are short; the prothorax is elongated; wings with numerous unbranched costal cross-veins; forelegs

originate from the anterior part of the thorax and are modified for catching prey-with claw and spines. Indeed, mantidflies are spectacular insects with characters such as the predatory legs of the Mantodea and the lace wings of the Neuroptera (PENNY 1982; REDBORG 1998; OHL 2009 and SNYMAN *et al.* 2012). Mantispid adults are active predators of small arthropods aided by their large compound eyes and raptorial forelegs. Nonetheless, some species feed on plants, plant exudates or floral nectarines (BOYDEN 1983). Many mantidflies are primarily diurnal insects; others are attracted to the light at night. They can be found on or near flowers using them as platforms for predation. Beside, these flies serve the environment acting as pollinators (REDBORG 1998; SNYMAN *et al.* 2012; KRÁL 2013). Mantispid larvae parasitize on spider egg sacs and on social wasp larvae. They are hardly to be seen. First instar larvae are campodeiform and active, while subsequent larval stages are scarabaeiform and mostly immobile. Cocoons are constructed in association with the larval food source, using silk spun through two modified malpighian tubules (BISSETT & MORAN 1967).

Family Mantispidae comprises approximately 400 species in at least 40 genera distributed worldwide (OHL 2004). Currently, four Mantispid subfamilies are recognized: Symphrasinae, Drepanicinae, Calomantispidinae and Mantispidinae (LIU *et al.* 2014). The latter is the largest subfamily, and the only one represented in Egypt. Mantispidinae ENDERLEIN 1910, is characterized by: head with vertex concave in frontal view, a single protarsal claw, lacking arolium and with distinct sulcus on procoxa approximately at 1/3 from its point of attachment (HOFFMAN 1992 and 2002).

Our knowledge of the Egyptian Mantispidae is limited. Only two species were recognized by KIMMINS (1950) in the country: *Mantispa auriventris* GUÉRIN-MÉNÉVILLE, 1838 and *Euclimacia africana* ESBEN-PETERSEN, 1927. var. *ragazziana* NAVÁS, 1929. Both species are now separate species in genus *Nampista*. Recent taxonomic treatment of the Mantispidae by OHL (2004, 2009) and SNYMAN *et al.* (2012) led to classification changes.

The goal of this study is to update our knowledge on the mantidflies proper to Egypt and to correct misidentified records. Illustrated keys to the genera and species are provided. In addition, a new record is described.

Material and methods

The checklist of the Egyptian Mantispidae was compiled from the literature and by re-identifying specimens deposited in the main Egyptian reference collection (ASUC: Ain Shams University Collection, Faculty of Science and CUC: Cairo University Collection, Faculty of Science). Names of genera and species were updated. For the examination of male terminalia, the entire abdomen was pulled out and placed in a 10% KOH solution for 30 – 120 minutes. Specimens were examined under a LABOMED, CZM4 dissecting, binocular microscope. Photos were taken by a Canon 500D equipped with a Canon 120mm macro lens. Small structures of the specimens were photographed using a Leica Z16 APOA stereoscopic microscope fitted with a Leica DFC 495 camera and a Leica flexi dome used as a light source. Accompanying Leica software was used for Z-stacking of images. Photographic compilations were executed in Corel Paint shop Pro X4. Terminology of the genitalia followed that of MACHADO & RAFAEL (2007) and LIU *et al.* (2014).

Results

Family Mantispidae LEACH, 1815

Key to the Egyptian taxa of Mantispinae:

- 1– Antennae lamellate and flagellomeres asymmetrical; prothorax shorter than pterothorax (*Nampista* NAVÁS, 1914).....2
- Antennae moniliform and flagellomeres symmetrical; prothorax about 1 ½ as long as pterothorax*Afromantispa nana* (ERICHSON 1839)
- 2– Forewing yellow, tip with indistinct dark marking (Fig. 1b); posterior half of abdomen with bright yellow markings *Nampista auriventris* (GUÉRIN-MÉNEVILLE)
- Forewing brown, with narrow hyaline area at postero-apical margin (Fig. 2b); abdomen black in color.....*Nampista ragaziana* (NAVÁS)

Genus: *Afromantispa* SNYMAN & OHL 2012 (New genus record)

Afromantispa SNYMAN & OHL, 2012: 67-93.

Type species: *Afromantispa tenella* (ERICHSON, 1839): 169.

D i a g n o s t i c c h a r a c t e r s : Antennae moniliform, variable in color with yellowish-white band on apical third; vertex not visible in lateral view, posterior vertex concave except for slight convex elevation directly posterior to and between antennal bases; posterior margin of occiput lacks short stoutsetae; compound eyes large, inter-eye space shorter than distance across eyes in facial view; labrum circular; apex and inner margins of mandible dark. Pronotum narrow and elongated, longer than pterothorax, surface with dark granules and setae. Wings with pterostigma slightly concave in dorsal view, with reddish appearance usually flanked by yellowish-white margin; radial cell 3 small and narrower than similar sized radial cells 1 and 2, single crossvein from third radial cell to anterior margin present; wing pigmentation always absent. Fore tarsal claw reduced to single claw lacking arolium, mid- and hind pretarsal claws pectinate (5-6 teeth) with middle tooth elongated, giving claw sharp triangular appearance, arolium present on mid and hind tarsi.

Male with ectoproct slightly enlarged, pseudopenis visible in lateral and dorsal view. Female genitalia have not been subject to a comparative study.

Afromantispa nana (ERICHSON 1839) (New species record) (Figs. 3&4)

Mantispa nana ERICHSON, 1839: 169.

Necyla bonhourei NAVÁS, 1922: 397. (Synonymized with *M. nana* by HANDSCHIN, 1959a: 198.)

Necyla arabica NAVÁS, 1914b: 214. (Synonymised with *A. nana* by SNYMAN et al. 2015: 12)

D e s c r i p t i o n : Male body length 8.5-13.5 mm. (Fig. 3b), female body 10-14 mm. long. Head yellow, with brown longitudinal line between antennal bases (Fig. 3f), characteristic three paler spots just posterior to antennal bases (Fig. 3d&3f); vertex medially brown flanked by paler yellowish patterns; antennae with 21 antennal segments, yellow with dark brown and yellowish bands; eyes large and rounded (Fig. 3c); clypeus light with dark base, labrum with brown basal spots, maxillary palp brownish. Pronotum cylindrical,

with two macula on anterior third, yellowish with fine brownish granules covering entire surface except for clear oval patch laterally, each granule with one short seta, anterior 1/3 of pronotum wider than posteriorly (Figs. 3c&3d); scutellum very small, light yellow in middle, laterally brown; meso. and metathorax yellowish with brown spots dorsolaterally, mesoscutal furrows conspicuous, terminate just prior to prominent central furrow. For legs yellowish with brown setae, coxa with heavily brown granules, inner side of femora and tibia brown, femora swollen, with single row of sharp unequal teeth (Fig. 3a), tarsus with single elongated claw; both middle and hind legs cylindrical, yellow with dark longitudinal line on femora. Wings hyaline with brown veins, vary in length from specimen to another, fore wing 7-11.5 mm., hind wing 6.5-10 mm., pterostigma of fore wings reddish with brown granules, each granule with one short seta (Fig. 3a). Abdomen cylindrical and elongated, anterior 1/3 brown, posteriorly yellowish (Fig. 3b).

Male genitalia: Tergite 9 relatively smaller than tergite 8, ventrally closely associated with base of sternite 9 (Fig. 4b), anterior margin of tergite 8 and tergite 9 moderately convex in dorsal view (Fig. 4d); sternite 9 semicircular in shape, provided with short fine setae (Fig. 4a), laterally cylindrical with bifid finger-like projection at apex (Fig. 4b); ectoproct triangular with fine pubescent short setae throughout (Fig. 4b), fused base, callus circus absent; gonarcus arched with sclerotized, outward projection in its distal third (Fig. 4e); gonocoxite 9 slender and elongated, strongly sclerotized and slightly arched (Figs. 4c&4e), membranous area present between gonocoxites; pseudopenis elongated, pointed apically, with 2 sclerotized bands at lateral base (Fig. 4f); mediuncus strongly sclerotized (Fig. 4f); hypomere feebly developed and sclerotized (Fig. 4f); ventromedial lobes directed posteromedially (Figs. 4c&4d)

World distribution: Afrotropical: Eritrea, Congo, Djibouti, South Africa, Sudan, and Upper Volta.

Palearctic: Arabian Peninsula.

Specimens examined: Wadi El Lega South Sinai, 5 August 1941 and 5 November 1941 (8 males) (CUC); Locality only listed as Egypt, (6 males) (CUC). Locality only listed as Egypt, (1 male) (ASUC)

Genus: *Nampista* NAVÁS, 1914

Nampista NAVÁS, 1914: 97.

Type species: *Nampista speciosa* NAVÁS, 1914: 97.

Forciada KOZHANCHIKOV, 1949: 355.

Type species: *Forciada relicta* KOZHANCHIKOV, 1949: 356. (Synonymised with *Nampista* by ASPOCK et al., 1980)

Diagnostic characters: Body large; antennae asymmetrically perfoliate or lamellate; vertex with small median tubercle toward hind margin. Prothorax shorter than prothorax, rugose. Wings always with pigmentation. Tergal foramen appears as distinct yellow band basally on anterior margin of tergite II. Tarsal claw of mid- and hind legs with 1-4 short and slender accessory teeth. Sexual dimorphism present. Besides external genitalic features females and males of *Nampista* can be readily distinguished by antennal morphology.

***Nampista auriventris* (GUÉRIN-MÉNEVILLE, 1838) (Fig. 1)**

Mantispa auriventris GUÉRIN-MÉNEVILLE, 1838: 202. (Transferred to *Nampista* by HANDSCHIN, 1960).

Mantispa apicalis LOEW, 1843: 433. (Synonymised with *Mantispa auriventris* by HAGEN, 1859).

Nampista speciosa NAVÁS, 1914: 98. (Synonymised with *Euclimacia auriventris* by ESBEN-PETERSEN, 1917).

Forciada relicta KOZHANCHIKOV, 1949: 356. (Synonymised with *Nampista auriventris* by HANDSCHIN, 1960).

Diagnostic characters: Body 15-16.8 mm. long; head reddish brown; vertex and pronotal base partially black (Fig. 1a); mandibles, labrum, clypeus and frons bright yellow; antennae with 37-38 segments (Fig. 1a). Fore wing uniformly yellow, with small infumate spot at tip (Fig. 1b). Hind wing yellow in costal and RA cell area, remainder hyaline (Fig. 1c). In both wings: costal area to pterostigma with 8-12 crossveins; wing veins yellow in anterior half, dark posteriorly; 1RA with 2-3 branches, 2RA with 3-4 branches, 3RA with 3 branches.

World distribution: Palaearctic: Greece, Turkey, Egypt, Palestine, Oman, Turkmenia, Uzbekistan, Tajikistan.

Local distribution: Siwa Oasis, (1 female)

Remark: This species is not represented in the Egyptian collections; it was collected in Egypt by OMER-COOPER 1936 (27 June) and deposited in the BMNH (British Museum of Natural History, London, UK). Its diagnostic characters and distributional data are according to OHL (2009).

***Nampista ragazziana* (NAVÁS, 1929) (Fig. 2)**

Euclimacia africana var. *ragazziana* NAVÁS, 1929: 385.

Pseudoclimaciella ragazziana (NAVÁS, 1929): new combination by OHL 2004: 200.

Diagnostic characters: Body 13.8-17.3 mm. long, dark reddish brown to black, thorax totally black; antennae with 32-40 segments (Fig. 2a). Fore wing 15-18.8 mm. in length, entire wing dark (infumate), sometimes with thin hyaline posterior margin (Fig. 2b). Anterior margin of hind wing dark (infumate), posterior to RA cells hyaline (Fig. 2b). In both wings: costal area to pterostigma with 8-10 crossveins; 1RA, 2RA, 3RA with only one branch.

World distribution: Northeastern Africa and Arabia: Egypt, Eritrea, and Yemen.

Local distribution: Siwa Oasis, (2 females).

Remark: This species is not represented in the Egyptian collections; the specimens were collected in Egypt by OMER-COOPER 1935 (1 May and 10 August) and deposited in the MCSN (Museo Civico di Storia Naturale, Genova, Italy). Its diagnostic characters and distributional data are according to OHL (2009).

Discussion

Since 1950 no revisional studies were carried out concerning representatives of family Mantispidae from Egypt. There for the present work attempted to assess Mantispidae systematics in the country. KIMMINS (1950) recognized *Mantispa auriventris* GUÉRIN-MÉNÉVILLE, 1838 and *Euclimacia africana* ESBEN-PETERSEN, 1927. var. *ragazziana* NAVÁS, 1929 from the Egyptian fauna. In (1960) HANDSCHIN transferred *Mantispa auriventris* GUÉRIN-MÉNÉVILLE, 1838 to *Nampista*. More recently, OHL (2009), SNYMAN *et al.* (2012, 2015) and MONSERRAT (2014) subjected this family to several taxonomic changes. OHL (2009) transferred two species group names to *Nampista*: *Euclimacia africana* (ESBEN-PETERSEN, 1927) and *Euclimacia africana* var. *ragazziana* (NAVÁS, 1929), with the latter raised to full species rank. Genus *Afromantispa* was described by SNYMAN *et al.* (2012) as a new genus. MONSERRAT (2014) erroneously synonymised *Afromantispa* with *Mantispa* which was consequently restored by SNYMAN *et al.* (2015). *Afromantispa nana* is recorded for the first time from Egypt during the current study. It was identified using the description by POIVER (1981) and the photos of the holotype of *A. nana*.

There are some species that have not been collected from Egypt but these are present in the neighboring countries, these species are likely to be present in Egypt, so we referred to them and to their distribution as follows:

Afromantispa tenella (ERICHSON, 1839)

D i s t r i b u t i o n : Afrotropical: DR Congo, Ivory Coast, Kenya, Nigeria, "Italian Somaliland" (Somalia, Djibouti, or Ethiopia), South Africa, Tanzania.

Cercomantispa paolina (NAVÁS, 1930)

D i s t r i b u t i o n : Afrotropical: Ethiopia.

Mantispa basilei (NAVÁS, 1930)

D i s t r i b u t i o n : Afrotropical: Ethiopia.

Mantispa fuliginosa LOEW in HAGEN, 1859

D i s t r i b u t i o n : Afrotropical: Sudan.

Mantispa lutea STITZ, 1913

D i s t r i b u t i o n : Afrotropical: Ethiopia.

Mantispa negusa NAVÁS, 1914

D i s t r i b u t i o n : Afrotropical: Ethiopia.

Nampista africana (ESBEN-PETERSEN, 1927)

D i s t r i b u t i o n : Afrotropical: Sudan.

Necyla sacra NAVÁS, 1914

D i s t r i b u t i o n : Palaearctic: Arabian Peninsula.

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Authors addresses:

Hayam EL HAMOULY

Department of Entomology, Faculty of Science,
Ain Shams University, Abbassia-Cairo, Egypt.

E-mail: elhamoulyy@hotmail.com

Telephone No: 00201025152842

Rabab F. SAWABY (corresponding author)

Department of Entomology, Faculty of Science,
Ain Shams University, Abbassia-Cairo, Egypt.

E-mail: rababsawab@sci.asu.edu.eg

rabab_sawaby@yahoo.com

Telephone No: 00201001035812

Plates



Fig. 1: *Nampista auriventris* (GUERIN-MENEVILLE, 1838). **1a.** head and thorax, dorsal aspect; **1b.** forewing; **1c.** hindwing. Inserts are labels attached to the pin of the *N. speciosa* (= *N. auriventris*) type specimen in BMNH (British Museum of Natural History). Photo: Dr. Ben Price

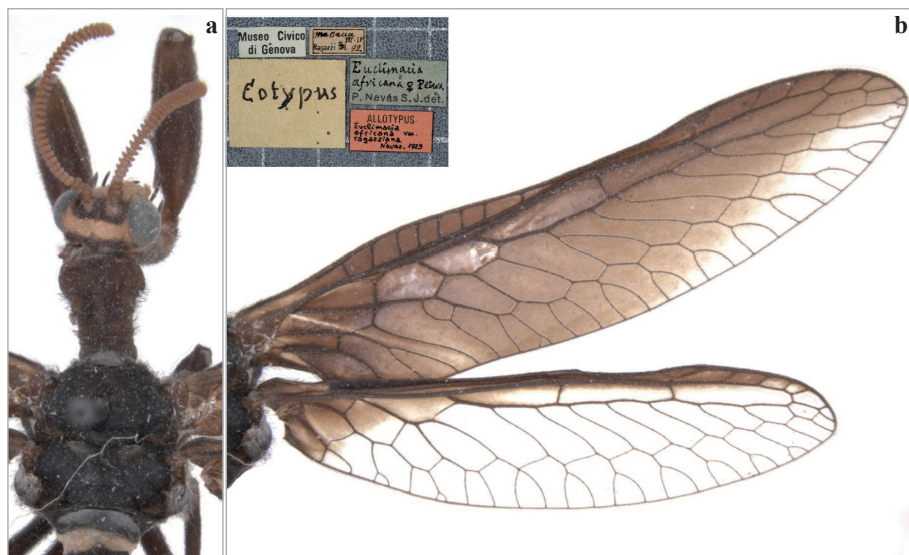


Fig. 2: *Nampista ragaziana* (NAVÁS, 1929). **2 a.** Head and thorax, dorsal aspect; **2 b.** forewing and hindwing. Insert is a compilation of the labels attached to the pin of the type specimen in MCSN (Museo Civico di Storia Naturale, Genova, Italy). Photo: Dr. Michael Ohl.



Fig. 3: *Afromantispa nana* (ERICHSON, 1839): **3a.** right wings, dorsal aspect; **3b.** habitus; **3c.** prothorax in lateral aspect; **3d.** prothorax in dorsal aspect; **3e.** male terminalia in dorsal aspect; **3f.** head, frontal view.

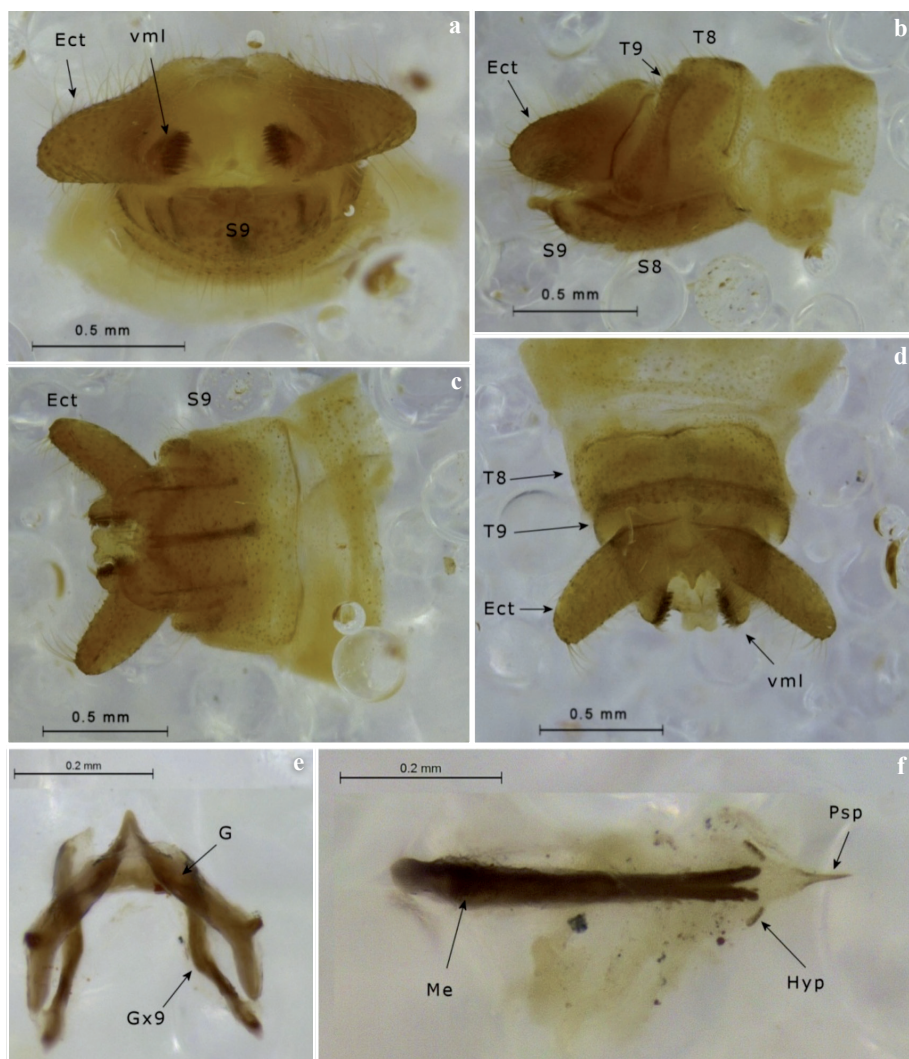


Fig. 4: **4a-d.** *Afromantispa nana* (ERICHSON, 1839) male terminalia: **4a.** posterior view; **4b.** lateral view; **4c.** ventral view; **4d.** dorsal view. Ect: Ectoproct; vml: ventromedial lobe; S#: denotes sternite numbers T#: denotes tergite numbers. **4e-f.** *Afromantispa nana* (Erichson, 1839) male genitalia: **4e.** Gonarcus and gonocoxites in dorsal view; **4f.** Meduncus and pseudopenis in dorsal view. G: Gonarcus; Gx9: gonocoxite; Hyp: Hypomere; Psp: Pseudopenis.

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