

Achille CASALE*

A revision of the genus *Atomopria* Kieffer, 1910 (Hymenoptera Diaprioidea Diapriidae)

Riassunto: *Revisione del genere Atomopria Kieffer, 1910 (Hymenoptera Diaprioidea Diapriidae).*

Il genere *Atomopria* Kieffer, 1911 include attualmente due sole specie descritte: *A. fulvicornis* Kieffer, 1911 (Italia nord-occidentale: Liguria) e *A. rufithorax* Kieffer, 1911 (Tunisia: Tunisi).

Nel presente lavoro sono descritte le seguenti dieci nuove specie del Nord Africa e delle Isole Canarie: *A. helenae* n. sp. (Algeria: Kabylia), *A. giachinoi* n. sp. (Algeria: Kabylia), *A. lisae* n. sp. (Algeria: Kabylia), *A. olmii* n. sp. (Isole Canarie: Gran Canaria), *A. ortegae* n. sp. (Isole Canarie: Tenerife), *A. boffai* n. sp. (Isole Canarie: Tenerife), *A. cavazzutii* n. sp. (Isole Canarie: Tenerife), *A. longicornis* n. sp. (Isole Canarie: Tenerife), *A. paglianoi* n. sp. (Isole Canarie: Tenerife), *A. scaramozzinoi* n. sp. (Isole Canarie: Tenerife). Sono descritti i caratteri diagnostici delle specie attribuite a questo genere e sono illustrati per la prima volta i genitali maschili di alcune specie. Viene ipotizzata, ma non proposta formalmente, la sinonimia del genere *Atomopria* con *Basalys* Westwood, 1832. Viene anche fornita una chiave per l'identificazione di tutte le specie, sia per le femmine, sia per i maschi. Infine, sono brevemente discusse alcune questioni relative alla tassonomia e alla biogeografia di questo genere.

Abstract: The genus *Atomopria* Kieffer, 1911 currently includes two only described species: *A. fulvicornis* Kieffer, 1911, from north-western Italy (Liguria) and *A. rufithorax* Kieffer, 1911, from Tunisia (Tunis).

The following ten new species are described from North Africa and Canary Islands: *A. helenae* n. sp. (Algeria, Kabylia), *A. giachinoi* n. sp. (Algeria, Kabylia), *A. lisae* n. sp. (Algeria, Kabylia), *A. olmii* n. sp. (Canary Islands, Gran Canaria), *A. ortegae* n. sp. (Canary Islands, Tenerife), *A. boffai* n. sp. (Canary Islands, Tenerife), *A. cavazzutii* n. sp. (Canary Islands, Tenerife), *A. longicornis* n. sp. (Canary Islands, Tenerife), *A. paglianoi* n. sp. (Canary Islands, Tenerife), *A. scaramozzinoi* n. sp. (Canary Islands, Tenerife). Diagnostic morphological features of representatives of this genus are described; male genitalia of some species are illustrated for the first time. The synonymy of the genus *Atomopria* with *Basalys* Westwood, 1832 is also hypothesized, but not proposed in this contribution. A key for identification of all species is provided, both for females and males. Finally, some taxonomic and biogeographic questions are briefly debated.

Key words: Hymenoptera; Diapriidae; *Atomopria*; revision; new species; Algeria; Canary Islands.

INTRODUCTION

The interest of the author of this contribution to Hymenoptera of the family Diapriidae arose from the regular occurrence of several representatives of this family in environments that he intensively explored in last decades: soil, humus, caves, upper hypogean zone and high altitude habitats. In these habitats, sifting soil or in pitfall traps, it is easy to meet diapriids (Decu *et al.*, 1998; Casale & Focarile, 2009). For these reasons, the present contribution is dedicated to an interesting little known genus, the species of which are smallest in size, micropterous or apterous in both sexes, and seem to be exclusively forest soil-inhabiting in the Western Mediterranean and Macaronesian areas.

MATERIALS AND METHODS

The type material in MSNG of the species described so far (*A. fulvicornis* Kieffer, 1911 and *A. ru-*

fithorax Kieffer, 1911) was examined. Type specimens of the new species here described were mostly collected by the author, colleagues and co-operators during two collecting travels to Algeria in 1981 and 1984, respectively, and to the Canary Islands in 1988. Further Canarian specimens were selected in the collections of the MCNT. For the new species here described, in some cases it was difficult to associate successfully males to females: this association was made only when males and females, from the same or close localities, showed agreeing morphological features. Diagnostic combinations and descriptions have been mostly based on characters of head, antennae, meso- and metasoma, and only secondly on colour and size, which in parasitoid Hymenoptera can be highly variable into the same species. In some cases, the scarceness of material made difficult to decide what

*Achille Casale, Department of Natural and Land Sciences, Section of Zoology, University of Sassari, Via Muroni 25, 07100 Sassari, Italy. E-mail: a_casale@libero.it

differences are to be included in the range of specific variation: thus, some taxonomic information, concerning in particular the Canarian species, is not exhaustive, because for one of the sexes in some species is unknown, or is unrecognized. Male genitalia were dissected, washed in distilled water, cleared in cold KOH, dehydrated in ethanol, cleared in Xylene and examined and illustrated, using standard techniques before their definitive inclusion on microscope slides using Canada balsam mountant each attached to the respective specimen. Line drawings were made using a camera lucida attached to stereoscopic microscopes Wild M-3 and Wild M-5, and a microscope Leitz Orthoplan.

Acronyms

MCNT, Museo de Ciencias Naturales, Santa Cruz de Tenerife, Tenerife, Canary Islands.

MRSN, Museo Regionale di Scienze Naturali, Torino (provisionally deposited in the author's collection for study).

MSNG, Museo Civico di Storia Naturale "G. Doria", Genova, Italy.

A1, A2, A3, ..., antennal segments.

T2, second abdominal tergite, or large tergite of authors.

HT, Holotype

LT, PLT, Lectotype, Paralectotype

PT, PTT, Paratype, Paratypes

Atomopria Kieffer, 1910

Atomopria Kieffer, 1910: 695

Atomopria Kieffer, 1911: 875

Atomopria Kieffer, 1916: 28

Atomopria Johnson, 1992: 128

Atomopria Casale, 1995: 8. Type species: *Atomopria rufithorax* Kieffer, 1911 (by subsequent designation).

NOTE. Kieffer's work in *Species des Hymenoptères d'Europe et d'Algérie* was published in parts, with different dates: pp. 593-752 published on 1 March 1910, *Atomopria* was described without included species, this makes the name available and the date of *Atomopria* Kieffer, 1910; pp. 753-912 published on 1 March 1911, the generic description is continued, and *A. rufithorax* designated, and since the genus is made available in 1910, the type species designation in 1911 is not an original designation, but a subsequent designation.

DESCRIPTION. Female: Body smooth, shiny, scarcely pubescent. Wings vestigial or absent. Small size (body total length from 1 to 2 mm). Head elongate, markedly opisthognathous in lateral view; pubescence bordering back of head greyish or whitish, developed. Mandibles reduced. Palpi very short; palpal formula 5-3. Frons mostly with a distinct median tooth and lamelliform outgrowths. Malar space very wide, wider than the width of the eye. Eyes hairy, small, placed in anterior position; ocelli very small or vanished. Antennae 12-segmented, with abruptly differentiated, 3-segmented club. Mesosoma modified due to reduction of wings. Suture dividing prothorax from mesoscutum deep; mesoscutum flat, suture dividing mesoscutum from scutellum normally absent, slightly distinct only in *fulvicornis*. Notauli absent. Tegulae reduced; wings reduced, not reaching beyond the posterior margin of propodeum, or absent. Scutellum without basal pit (two smallest and superficial foveae are however hardly distinguishable in a male of *A. fulvicornis*). Propodeum medially glabrous, with low median keel. Femora dilated subapically; tarsi 5-segmented; protibial spur very long. Petiole often with rather long, whitish, scale-like hairs. T2 pubescent, occupying most of the length of metasoma, with front margin entire.

Male: Otherwise as in female. Body a little narrower and more elongate. Wings vestigial or absent. Antennae long, filiform, 14-segmented; flagellar segments with relatively short hairs; antennomere 4 without or with weak emargination, sometimes ending distally in a tooth (Figs. 9-18). Aedeagus as in Figs. 4, 29, particularly similar to those of *Spilomicrus* and *Basalys* (= *Loxotropa* Auct.) representatives (Teodorescu, 1970).

HOSTS AND ECOLOGY. Hosts unknown, but almost certainly puparia of Diptera. All specimens were collected sifting soil and rotting leaves in forest.

KEY TO SPECIES

Females (antennae 12-segmented)

- 1 - Frons with lateral projections and median tooth reduced or virtually missing (Figs. 1-2) (species of the Mediterranean Area)2
 - Frons with lateral projection and median tooth very developed (Fig. 6) (species of the Canary Islands)5
 2 - Suture dividing mesoscutum from scutellum reduced but distinct; wings reduced to small stamps (Fig. 1) (Body reddish, head and metasoma brown or

piceous-black, mouth parts and antennae reddish yellow, legs testaceous) (Italy, Liguria).....
**1. fulvicornis** Kieffer, 1911
 - Suture dividing mesoscutum from scutellum fully absent; body apterous or brachypterous3
 3 - Antennal club blackish, as long as the rest of flagellum (Figs. 2, 5); petiole with dense, scale-like pubescence (body blackish, thorax and antennae, except the club, reddish) (Tunisia).....
**5. rufithorax** Kieffer, 1911
 - Antenna completely reddish or reddish yellow, at most with darkened apical club. Petiole almost glabrous on the dorsal side4
 4 - Smaller in size (body total length: mm 1.0); head (Fig. 23) from above with sides markedly constricted to the neck; eyes small, almost flat; antenna (Fig. 24) very short, antennal club large, wide, slightly shorter than the rest of flagellum; colour fully reddish yellow, only head and metasoma a little darkened (Algeria, Kabylia).....**4. lisae** n. sp.
 - Larger in size (body total length: mm 1.51); head (Fig. 22) subquadrate, with almost parallel sides; eyes larger and very prominent; antenna (Fig. 19) long, antennal club less tickened, markedly shorter than the rest of flagellum; colour reddish, head and metasoma brownish (head and eyes with dense and long hairs) (Algeria, Kabylia).....**2. helenae** n. sp.
 5 - Brachypterous; wings very reduced, reaching the middle of propodeum (antennal club, head and metasoma blackish; hairs of head and metasoma very long and decumbent) (Fig. 6) (Canary Islands: Gran Canaria)**6. olmii** n. sp.
 - Wings absent6
 6 - Antennal club (Fig. 20) and metasoma reddish-brown, less contrasting in colour with flagellum, mesosoma and legs, which are yellow or reddish yellow; head from above short, subglobose (Fig. 21), brown or reddish-brown; small size (body total length: mm 1.00-1.03) (Canary Islands: Tenerife)
**7. ortegae** n.sp.
 - Antennal club and metasoma dark brown or blackish, more strongly contrasting in colour with flagellum and legs, which are yellow or reddish-yellow, and with the mesosoma, which is reddish-brown or ferruginous. Head from above elongate, longer than wide, elongate or parallel sided, dark-brownish or black. Species larger in size (mm 1.50-1.87)7
 7 - Antennal club very large, globose; A 11 very transverse (Fig. 26); head strongly punctate-pubescent (Fig.

25) (Canary Islands: Tenerife).....
**12. scaramozzinoi** n. sp.
 - Antennal club smaller, with less transversal segments (Fig. 27)8
 8 - Metasoma very elongate; large T2 with gently arcuate sides (Fig. 7) (Canary Islands: Tenerife).....
**9. cavazzutii** n. sp.
 - Metasoma shorter, egg shaped; large T2 very short and wide, with strongly arcuate sides (Fig. 8) (Canary Islands: Tenerife).....**11. paglianoi** n. sp.

Males (antennae 14-segmented)

1. Suture dividing mesoscutum from scutellum distinct; alar stumps less reduced, reaching the apex of propodeum (Fig. 3); antennae long, segments from A5 to A13 about two times longer than wide (Fig. 4). Petiole with dense, long, whitish pubescence (relatively large sized species: body total length mm 1.84-2.00; head piceous black, mesosoma and metasoma brown, antennae and legs reddish) (Italy, Liguria)
**1. fulvicornis** Kieffer, 1911
 - Suture dividing mesoscutum from scutellum absent; alar stumps smallest, at least reaching the middle of the propodeum, or fully absent; antennae moniliform, segments from A5 to A13 as long as wide or a little longer than wide. Petiole with short pubescence, often reduced to the lateral sides.....2
 2 - Frons with median tooth reduced or absent (micropterous or apterous species from Northern Africa)3
 - Frons with developed median tooth (species from Canary Islands).....5
 3 - Larger in size (body total length: mm 1.66); head from above with almost parallel sides; eyes very prominent; wings fully absent (colour reddish, with head markedly darker, piceous-black, and metasoma brownish) (Algeria, Kabylia).....**2. helenae** n. sp.
 - Smaller in size (body total length: mm 1.05-1.33); head from above with oblique or curved sides (colour fully reddish, at least with head and metasoma slightly darker, piceous brown)4
 4 - A4 shorter and thickened, slightly longer than A5, with deep emargination, ending distally in a weak tooth (Fig. 29); head from above subpentagonal (Fig. 28); larger in size (body total length : mm 1.21-1.33) (Algeria, Kabylia)**3. giachinoi** n. sp.
 - A4 longer, 1.5 times as long as A5, with weak emargination distally rounded (Fig. 31); head from above subglobose (Fig. 30); smaller in size (body total

length: mm 1.05) (Algeria, Kabylia).....**4. *lisae* n. sp.**
 5 - Head from above narrow and very elongate, almost parallel sided (Fig. 32); A4 with distinct emargination, ending distally in a distinct tooth (colour reddish yellow, head and metasoma darkened, piceous brown; antennal segments from A5 to A14 slightly darkened) (Canary Islands, Tenerife).....**8. *boffai* n. sp.**
 - Head from above wider and shorter (Figs. 35, 37, 39); A4 without or with very weak emargination.....6
 6 - Head from above subglobose, reddish brown as the metasoma, slightly contrasting in colour with thorax, antennae and legs, which are yellow or reddish, the latter at least darkened from A5 to A13. A4 slightly or not emarginated (Fig. 34). Small size (mm 1.15-1.21) (Canary Islands, Tenerife)**7. *ortegae* n. sp.**
 - Head from above markedly elongate, dark piceous or blackish as the metasoma, and markedly contrasting in colour with the reddish thorax and the yellow legs7
 7- Head from above almost parallel sided (Fig. 37); A4 with deep emargination in the basal half (Fig. 38); metasoma elongate, markedly longer than mesosoma; larger size (mm 1.81) (Canary Islands, Tenerife)
**12. *scaramozzinoi* n. sp.**
 - Head from above distinctly constricted to the neck; A4 without or with weak, oblique emargination in the basal half; metasoma small sized, short, egg-shaped, not longer than mesosoma; smaller size (mm 1.30-1.42).....8
 8- Head posteriorly with more markedly constricted sides (Fig. 35); antennae thin, elongate, as long or longer than body, with segments from 4 to 7 about twice as long as wide; A4 without distinct emargination (Fig. 36) (Canary Islands, Tenerife)
**10. *longicornis* n. sp.**
 - Head posteriorly with slightly constricted sides (Fig. 39); antennae markedly shorter and thicker, shorter than body, with segments from 5 to 8 moniliform, 1.30-1.50 times longer than wide; A4 with distinct, basal oblique emargination (Fig. 40).....***cavazzutii* n. sp.**

1. *Atomopria fulvicornis* Kieffer, 1911

A. fulvicornis Kieffer, 1911: 877

A. fulvicornis Kieffer, 1916: 28

A. fulvicornis Johnson, 1992: 129

A. fulvicornis Casale, 1995: 8

LOC. TYP.: Italy, Liguria: Leivi.

TYPE MATERIAL: LT female here designated (selected

but not designated by Ghesquière, in litt.) “Leivi XII - [18]98 Solari” “*Atomopria fulvicornis*” [handwritten by Kieffer] “Holotypus ♀” “*Atomopria fulvicornis* Kieffer, J. Ghesquière rev., 1959”; PLTT here designated 2 males “Ruta, Liguria 14-XI-[1]902 A. Doderò” “*Atomopria fulvicornis*” [handwritten by Kieffer] “Allotypus” (MSNG).

Further material examined (besides the type material): 1 male, 1 female: Liguria, “M. di Portofino (Genova) 19.V.1982 G. Bartoli”; 1 female “La Spezia, Villagrossa, m 600, 7.IV.1985, N. Sanfilippo”; 1 female “Liguria, Gattorna (GE) 26.01.1997 M.B. Invernici” (MSNG).

DESCRIPTION. Female: (Fig. 1) Body total length: mm 1.83. Brachypterous. Colour mostly dark-brown or blackish, shiny; thorax, antennae and mouth-parts reddish; legs yellow. Head globose, with gently rounded sides; frons glabrous, wide, sub-triangular, smooth, with prominent anterior angles; median tooth obsolete; ocelli not distinct. Suture dividing mesoscutum from scutellum superficial but distinct; wings very shortened, not reaching the posterior angles of propodeum. Metasoma narrow, elongate, tapered to apex; petiole with dense, whitish, scale-like pubescence; large 12 with scarce, long, decumbent hairs.

Male: Body total length: mm 1.84-2.00. Agreeing with female in general features, but differing in the following: body narrower and slender, pronotal pubescence with longer, decumbent hairs. Head larger and more globose; frons with a distinct tooth on the posterior angle of the triangular frontal depression. Antennae as in Fig. 4; A4 with weak but distinct, arcuate emargination. Suture dividing mesoscutum from scutellum deeper; wings as reduced as in female, but a little narrower, scale-like. In one specimen, there are two smallest foveae at the base of scutellum (Fig. 3).

REMARKS. This species is very interesting both for having the most plesiomorphic characters in the genus (suture dividing mesoscutum from scutellum distinct, wings atrophic but evident) and for being the only species known from Europe, in NW Italy, apparently endemic to Liguria, in a relict area of the northern Tyrrhenian region.

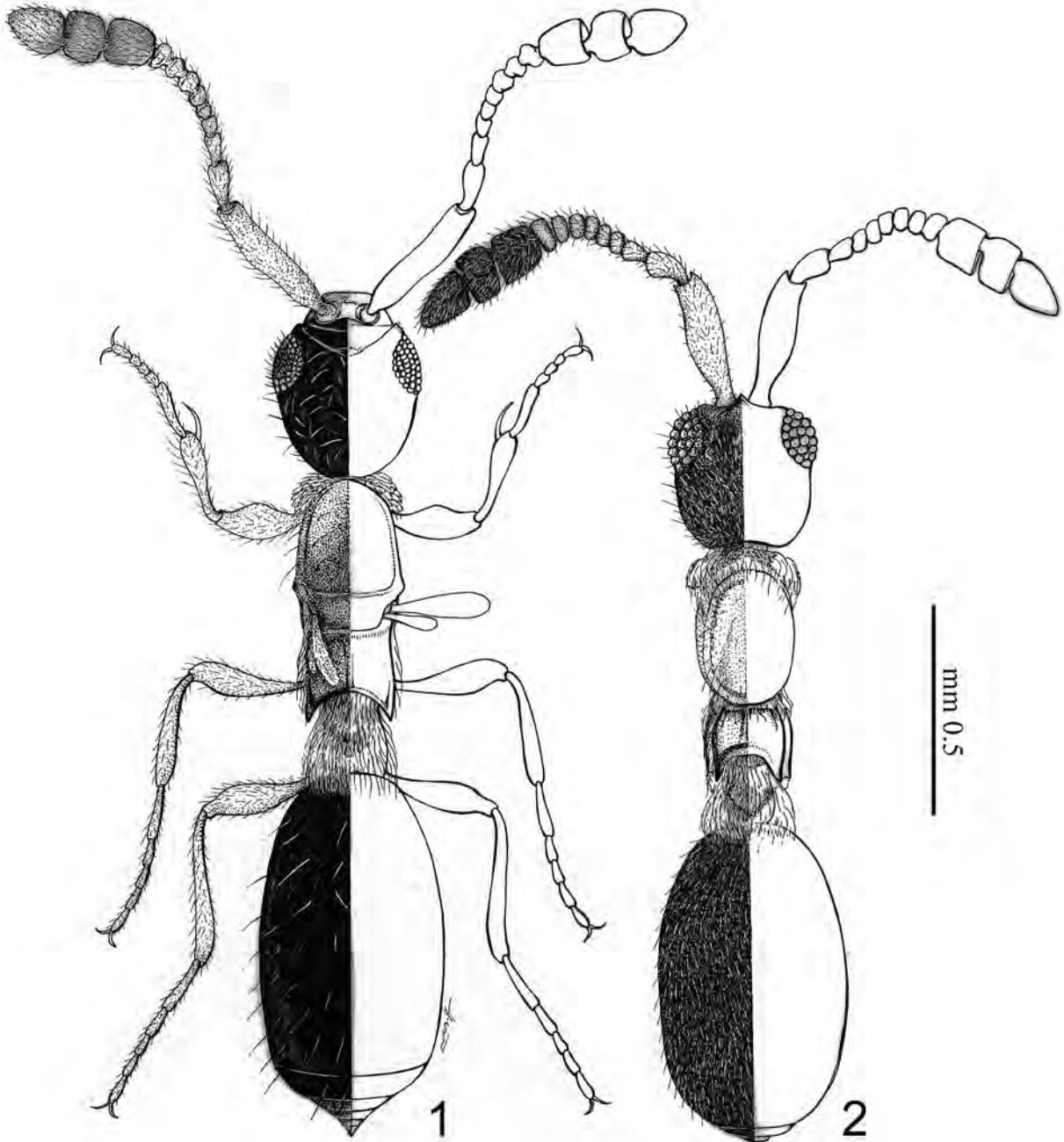
DISTRIBUTION. Italy, Liguria.

All specimens were collected in woods, sifting soil and rotting leaves.

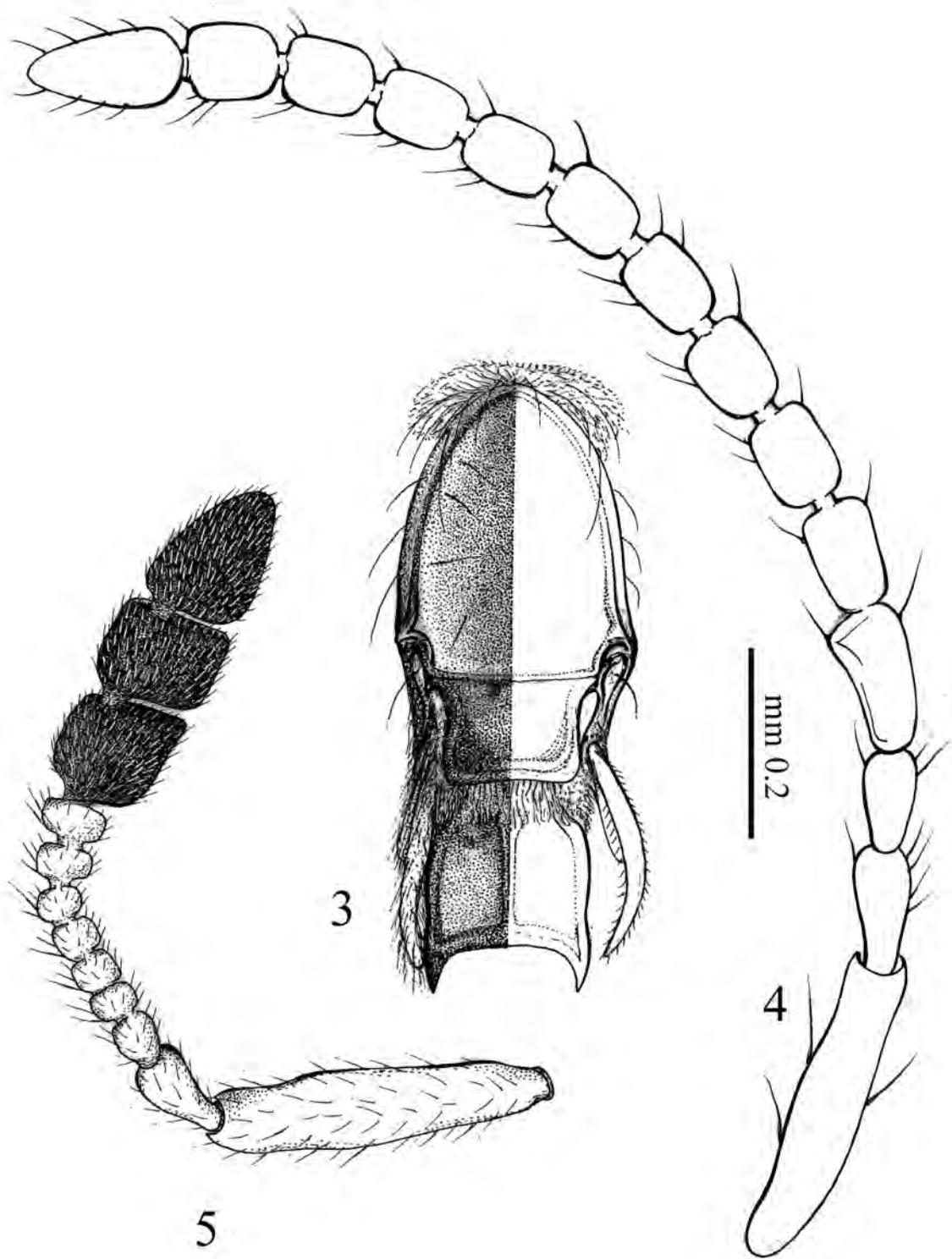
2. *Atomopria helenae* n. sp.

LOC. TYP.: Algeria, Jijel, Forêt de Guerrouch.

TYPE MATERIAL: HT female “Algeria, Jijel, Ft. de



Figs. 1-2. *Atomopria* spp., females, habitus in dorsal aspect. 1: *A. fulvicornis*, female holotype; 2: *A. rufithorax*, female holotype.



Figs. 3-5. *Atomopria* spp., males and females. 3: *A. fulvicornis*, male paralectotype, thorax in dorsal aspect; 4: idem, antenna; 5: *A. rufithorax*, female holotype, antenna.

Guerrouch m 1200, 4/10-XI-1984" (Algeria 1984. A. Casale leg.; 1 PT male "Algeria, Piccola Kabilia, Ft. d'Akfadou 12-XI-1984" (MRSN).

SPECIFIC EPITHET. I wish to dedicate this new species to Elena Gavetti (in Latin: *Helena*), Curator of zoological collections at the MRSN, for her support in collecting specimens in the mountains and forests of Algeria.

DESCRIPTION. Female: Body total length: mm 1.51. Wings fully absent. Colour mostly reddish, head and metasoma brownish; legs reddish-yellow. Head (Fig. 22) elongate, with almost parallel sides and long, sparse, decumbent hairs; frontal tooth small; eyes relatively large, prominent. Antennae long (Fig. 19): A1 as long as flagellum excluding the antennal club; joints from A4 to A8 each about as long as wide. Propodeum with well developed median carina. Petiole as long as the propodeum; metasoma elongate-oval. T2 with sparse, very long hairs.

Male: Body total length: mm 1.66. Agreeing with the female in the general characters, but differing in the following: head blackish, a little shorter and more globose. Antennae yellow, very elongate; A4 with distinct, deep emargination. Aedeagus as in Figs. 9-11.

REMARKS. Well distinct among the North African species known so far for the relatively large size and the morphological characters described above and in the keys. The association of the male with the female is not sure, the different sexes coming from two different localities which are, however, close each to other and ecologically very similar. So, the accordance of the respective characters make this association very likely.

DISTRIBUTION. Algeria, Lesser Kabylia: Jijel, Guerrouch Forest; El Kseur, Akfadou Forest.

Specimens were collected at 1000-1200 m, sifting soil in oak forest.

3. *Atomopria giachinoi* n. sp.

LOC. TYP.: Algeria, Djurdjura, Tala Guilef.

TYPE MATERIAL. HT male "Algeria, Djurdjura, Tala Guilef m 1100, 30/31-X -1/XI - 1984" (Algeria 1984, A. Casale leg.); 1 PT male (same as holotype) (MRSN).

SPECIFIC EPITHET. I wish to dedicate this new species to Pier Mauro Giachino, good friend and estimated entomologist, for his support in collecting specimens in the mountains and forests of Algeria and many other areas.

DESCRIPTION. Male: Body total length: mm 1.21-1.33. Micropterous. Colour mostly reddish yellow, with head and metasoma darkened, reddish brown. Head short, from above subpentagonal, with sides narrowed

to the neck (Fig. 28); eyes prominent. Antennae long, joints from A5 to A13 about 1 time ½ longer than wide; A4 relatively short, hardly longer than A5, with distinct, curved emargination, ending distally in a weak tooth (Fig. 29). Wings reduced to small scales, not reaching the apex of the propodeum. Metasoma egg-shaped, relatively short, scarcely pubescent. Aedeagus as in Figs. 15-17.

Female: unknown.

REMARKS. A well characterized species, easily distinguishable from the other North African species for the peculiar structure of head, antennae and aedeagus (see figures and key).

DISTRIBUTION. Algeria, Djurdjura massif, Tala Guilef, 1100 m. The specimens were collected sifting soil in forest of *Cedrus atlantica*.

4. *Atomopria lisae* n. sp.

LOC. TYP.: Algeria, Jijel, Guerrouch forest.

TYPE MATERIAL. HT female "Algeria, Jijel, F.t. de Guerrouch m 1200, 4/10 - XI - 1984" (Algeria 1984, A. Casale leg.); 1PT male, same as holotype (MRSN).

SPECIFIC EPITHET. I wish to dedicate this new species to my dear friend Lisa Levi, former Curator of zoological collections at the MRSN, for her support in collecting specimens in the mountains and forests of Algeria, and elsewhere.

DESCRIPTION. Female: Body total length: mm 1.00. Apterous. Colour yellow reddish; head and metasoma a little darkened, reddish; legs and antennae yellow, only the antennal club slightly darkened. Head from above elongate, with lateral sides narrowed to the neck (Fig. 23). Eyes very small, almost flat. Frontal tooth small but evident. Antennae (Fig. 24) very short; joints from A4 to A9 strongly transverse, about 3 times as wider as long. Propodeum with longitudinal carina and posterior angles very reduced. Petiole small, transverse. Metasoma egg-shaped; T2 with gently curved lateral sides.

Male: Body total length: mm 1.05. Agreeing with the female in the general characters, but differing in the following: body more slender. Head subglobose (Fig. 30). Eyes larger. Antennae moderately elongate, entirely yellow testaceous; A4 relatively long, 1,5 times as long as A5, with a weak, oblique emargination, not ending distally in a tooth (Fig. 31). Aedeagus as in Fig. 12.

REMARKS. A well characterized species, markedly distinct from all other North African species by the smallest size, and other features stressed in key and description.

DISTRIBUTION. Algeria, Lesser Kabylia: Jijel, Guerrouch forest, m 1200 about. The specimens were collected sifting soil in oak-forest (*Quercus* spp.).

5. *Atomopria rufithorax* Kieffer, 1911

A. rufithorax Kieffer, 1911: 877.

A. rufithorax Kieffer, 1916: 28

A. rufithorax Johnson, 1992: 129

LOC. TYP.: Tunisie

TYPE MATERIAL. HT female "Tunisi dint. 19-I-1883. Miceli" "Atomopria rufithorax K." "Typus", "Atomopria rufithorax Kieff. J. Ghesquière rev., 1959 (MSNG).

DESCRIPTION. Female: (Fig. 2) Body total length: mm 1.80 (HT). Apterous. Color mostly blackish; thorax, mouth parts and antennae (except the club) yellow reddish; antennal club black; legs yellow. Teguments shiny. Head relatively short and wide, with gently rounded sides; ocelli almost fully reduced; frontal tooth well distinct. Antennae short; antennal club very large, wide, about as long as the rest of flagellum (Fig. 5). Propleurae and petiole with dense, greyish, scale-like pubescence. Metasoma short and wide, egg-shaped; T2 with slightly arcuate sides.

Male: unknown.

REMARKS. Relatively isolated among the North African species known so far, *A. rufithorax* seems to be related, for the general shape of body, antennae, and the colour pattern, to some Macaronesian species, as *A. scaramozzinoi* and *A. paglianoi*, both from Tenerife (Canary Islands).

DISTRIBUTION. Tunisia, near Tunis (MSNG).

6. *Atomopria olmii* n. sp.

LOC. TYP.: Spain, Canary Isl., Gran Canaria: Pozo de la Nieve.

TYPE MATERIAL: HT female "Gran Canaria. Pozo de la Nieve m 1600. 11. III. 1988. A. Casale leg." (MRSN).

SPECIFIC EPITHET. I wish to dedicate this new species to my good friend Massimo Olmi, estimated entomologist and specialist of Hymenoptera Dryinidae of the world, for his support in collecting specimens in the Canary islands and other areas.

DESCRIPTION. Female: Body total length: mm 1.45 (HT). Wings reduced to small, narrow scales reaching the base of propodeum. Colour mostly brown reddish, with head and metasoma blackish and antennal club chestnut brown; legs and antennae (excl. joints from A10 to A12) yellow orange. Head (Fig. 6) large, elongate, with almost parallel sides; frons with median tooth and lateral projections very prominent; eyes small, a little prominent; ocelli evident. Antennal club shorter than flagellum; joints A10 and A11 about as long as wide.

gate, with almost parallel sides; frons with median tooth and lateral projections very prominent; eyes small, a little prominent; ocelli evident. Antennal club shorter than flagellum; joints A10 and A11 about as long as wide.

Mesoscutum relatively large, with five pairs of bristles; short, dense, whitish pubescence.

Metasoma very narrow and elongate, almost truncate at the apex; large T2 with almost parallel sides and with scarce, but long yellowish hairs.

Male: unknown.

REMARKS. This taxon is well characterised, amongst the other Canarian species (all from Tenerife), by the persistence of alar stumps in female.

DISTRIBUTION. *A. olmii* is so far the only known species from Gran Canaria. The HT was collected by pit traps in *Pinus* forest.

7. *Atomopria ortegae* n. sp.

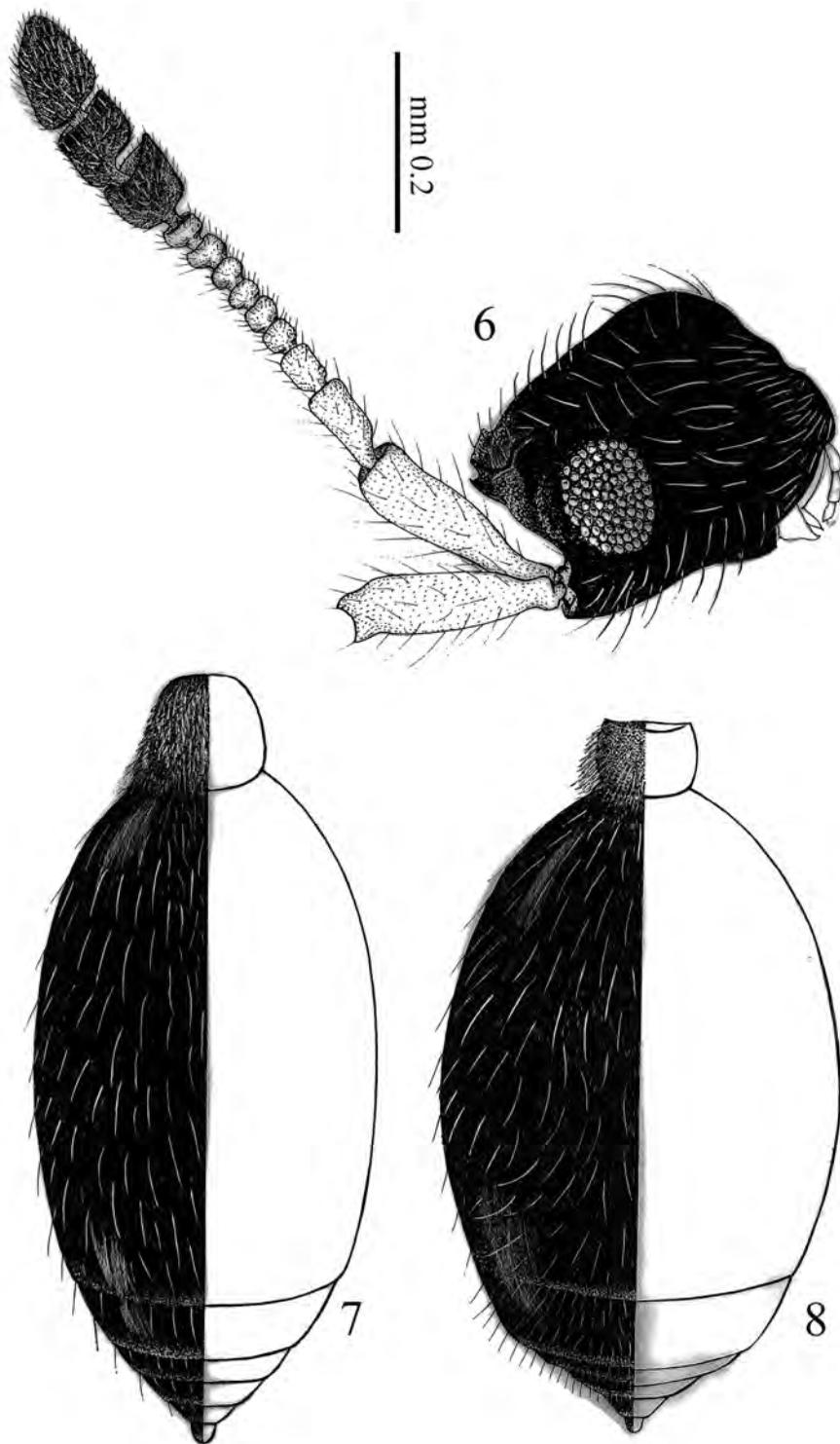
LOC. TYP.: Spain, Canary Isl., Tenerife, Mt. Los Silos

TYPE MATERIAL. HT female, Mt. Los Silos 12 - 3 - 1985. A. Aguiar » (MCNT); PTT: 2 females, Erjos, M. de l'Agua m 1200 23. III. 1988. A. Casale " (MRSN); 1 male "Bailadero 9. XII. 1962. R. Arozarena"; 1 male "M.te Aguirre. 6. VI. 1965. R. Arozarena" (MCNT); 1 male "Erjos, M. de l'Agua m 1200 23. III. 1988 A. Casale" (MRSN).

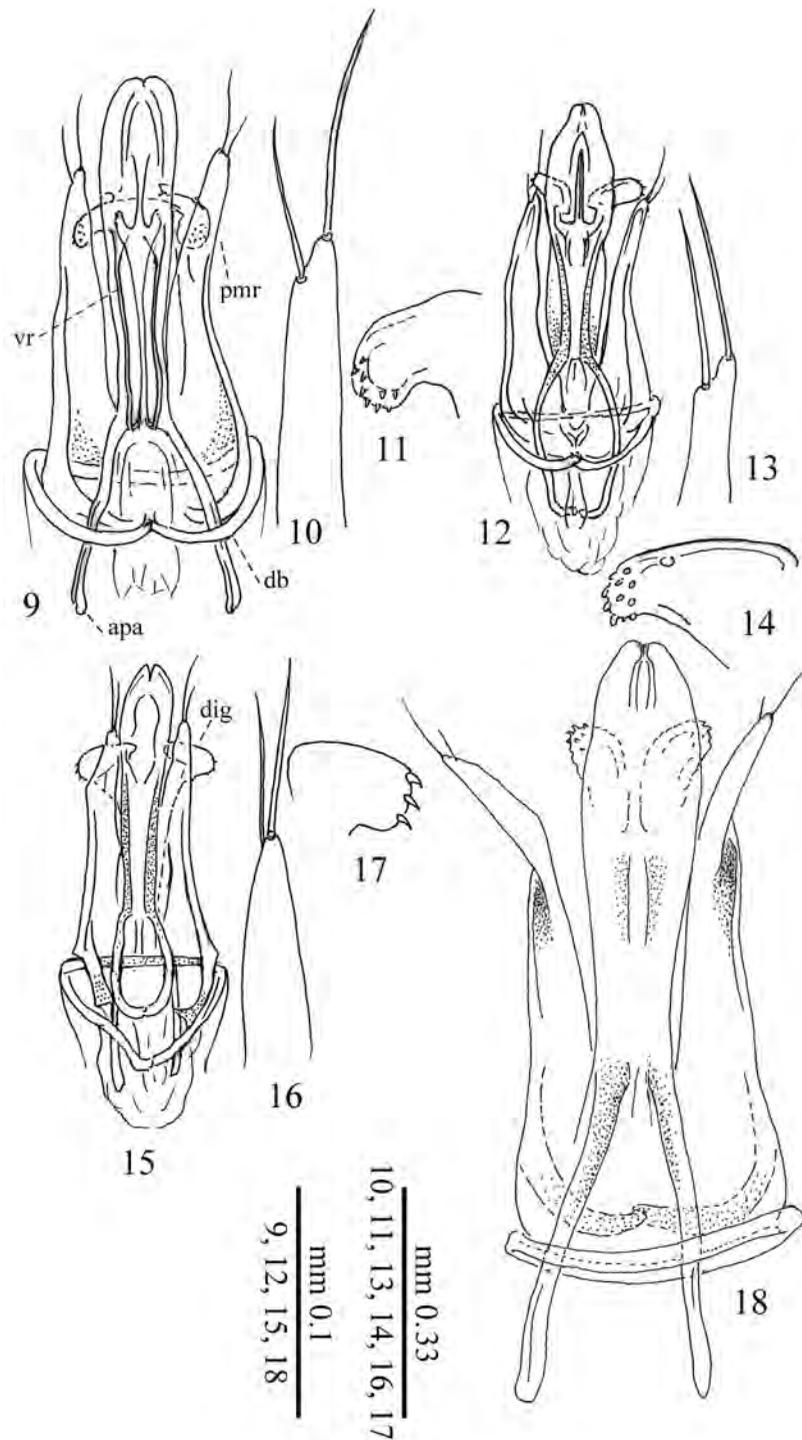
SPECIFIC EPITHET. I wish to dedicate this new species to Gloria Ortega, curator of the entomological collections at the MCNT, for having provided in 1988 important material and support in my investigations in Canary Islands.

DESCRIPTION. Female: Body total length: mm 1.00-1.03. Colour reddish yellow; head, metasoma and antennal club brownish, poorly contrasting in colour with the mesosoma. Head (Fig. 21) from above relatively short, subglobose, with gently rounded sides; eyes small, almost flat; ocelli very reduced, frontal tooth and lateral projection poorly developed. Antennal club less sharply widened than in the other Canarian species, about as long as A1 and shorter than the rest of flagellum (Fig. 20). Pronotum, propodeum and petiole only with scarce, short pubescence. Metasoma elongate oval; T2 with gently arcuate sides, and with long, scarce, decumbent hairs.

Male: Length mm 1.15-1.21. Agreeing with the female in the general characters, but differing in the following: antennae long, as long as the body or a little longer; A4 and A5 about as long as the pedicel; A6-



Figs. 6-8. *Atomopria* spp. 6: *A. olmii* n. sp., female holotype, head in lateral aspect; 7: *A. cavazzutii* n. sp., female holotype, gaster; 8: *A. paglianoi* n. sp., female holotype, gaster.



Figs. 9-18. *Atomopria* spp., male genitalia in dorsal aspect. 9: *A. helena* n. sp., male paratype, aedeagus; 10: idem, apex of paramere; 11: digitus; 12: *A. lisae*, male paratype, aedeagus; 13: idem, apex of paramere; 14: idem, idem, digitus; 15: *A. giachinoi*, male paratype, aedeagus; 16: idem, apex of paramere; 17: idem, digitus; 18: *A. cavazzutii* n. sp., male paratype, aedeagus. Acronyms: apa, apodeme of aedeagus; db, dorsal bridge of basal ring; dig, digitus; pmr, paramere; vr, volsellar ridge.

A8 about two times as long as wide; A9-A13 one time and 1/2 as long as wide; A4 hardly or not emarginate in the basal half (Fig. 34).

REMARKS. This small sized, peculiar species seems to be very isolated among the other Canarian *Atomopria* species, and could be more closely related to the species from Algeria described above.

DISTRIBUTION. Canary Islands, Tenerife, rather largely distributed along the Laurisilva zone in the North of the island, from the NW (Teno massif) to the NE (Anaga massif): Mt. Agua, Mt. los Silos, Mt. Aguirre, Mt. Anaga: El Bailadero (MRSN, MCNT).

8. *Atomopria boffai* n. sp.

LOC. TYP.: Spain, Canary Isl., Tenerife: Mt. Agua.

TYPE MATERIAL. HT male "Canarie, TF, Erjos, Mt. Agua m 1200, 23. III. 1988. A. Casale leg." (MRSN)
SPECIFIC EPITHET. I wish to dedicate this new species to my friend Giovanni Boffa, painter and entomologist, former curator of entomological collections at the MRSN, for his support in collecting specimens in the mountains and forests of Algeria and in many other areas.

DESCRIPTION. Male: Body total length: mm 1.33. Colour mostly reddish yellow; head and metasoma blackish brown; antennae reddish yellow, a little darkened from A5 to A14. Integuments shiny, with fine but distinct granulate microsculpture, particularly evident on head and mesoscutum. Wings fully absent.

Head very narrow, elongate, longer than wide, with almost parallel sides (Fig. 32); eyes small, moved to anterior position, a little prominent; ocelli very reduced. Median tooth and lateral projections of frons very prominent. Antennae relatively short and thickened, with joints from A8 to A13 strongly transverse; A4 with a distinct emargination, ending distally in a weak tooth (Fig. 33). Mesoscutum about two times as longer as wide, convex. Metasoma relatively narrow, elongate oval; T2 with gently arcuate sides.

Female: unknown.

REMARKS. Apparently related to *A. scaramozzinoi* n. sp. described below, *A. boffai* n. sp. is however peculiar amongst the Canarian species for the strongly elongate, narrowed head and for the structure of antennae, with A4 deeply emarginate and apical joints very transverse. The only known male comes from the north-western part of Tenerife, where the species is sympatric with *A. scaramozzinoi*, *A. ortegae* and *A. cavazzutii*.

DISTRIBUTION. Canary Island: Erjos, Mt. Agua m 1200, in Laurisilva forest.

9. *Atomopria cavazzutii* n. sp.

Loc. typ.: Spain, Canary Isl., Tenerife: Mt. Agua.

TYPE MATERIAL. HT male "Canarie, TF, Erjos, Mt. Agua m 1200. 23.III: 1988. A. Casale leg." (MRSN); PTT: 2 females, 3 males, same as holotype (MRSN, MCNT).

Specific epithet. I wish to dedicate this new species to my good friend Pierfranco Cavazzuti, estimated carabidologist, for his support in collecting specimens in both Algeria and Canary Islands, and in many other areas.

DESCRIPTION. Female: Body total length: mm 1.56-1.87. Wings fully reduced. Colour mostly reddish with abdominal T2 dark brown; head and antennal club blackish; rest of antenna and legs reddish yellow. Head from above elongate, with almost parallel sides; frons with median tooth and lateral projection very prominent; eyes small, in anterior position, a little prominent; ocelli very small but evident. Antennae relatively short; joints from A4 to A9 transverse, about 2 times as wider as long; antennal club less thickened than in *scaramozzinoi*, joints A10 and A11 about as long as wide. Mesoscutum narrow, about 2 times as longer as wide. Petiole with short, dense, whitish pubescence on lateral sides. Metasoma narrow and very elongate; T2 with its largest width about at middle, covered by relatively long, decumbent hairs (Fig. 7).

Male: Body total length: mm 1.30-1.36. Head as in Fig. 39. Agreeing to the female in the general characters, but differing in the following: antenna long, about as long as the body; joints from A1 to A3 yellow, from A4 to A13 a little darkened, reddish or reddish brown; joints from A5 to A8 moniliform, shorter than in *longicornis*, 1.30-1.50 times longer than wide; A4 with an oblique, very weak but distinct emargination in the basal half (Fig. 40). Aedeagus as in Fig. 18.

REMARKS. Closely related to *A. longicornis*, of which it seems to be the western substitute in Teno Massif (N.W. Tenerife).

DISTRIBUTION. Canary Islands, Tenerife, Mt. Agua. Sampled only in Laurisilva forest by pit-traps.

10. *Atomopria longicornis* n. sp.

LOC. TYP.: Spain, Canary Isl., Tenerife: Taganana.

TYPE MATERIAL. HT male "Vueltas Taganana 28. 2.

1989 A. Agular"; PT: 1 male, same as holotype, "26. 2. 1976, J.M. Fernandez" (MCNT).

SPECIFIC EPITHET. The name *longicornis* (= long-horned) stresses the main diagnostic feature of this new taxon in males.

DESCRIPTION. Male: Wings absent. Length mm 1.36-1.42. Mesosoma, legs and joints from 1 to 13 of antenna yellow; head dark brown or blackish, metasoma and antennal joints from A4 to A13 chestnut-brown or dark reddish. Head (Fig. 35) from above elongate, densely punctate-pubescent, about twice as long as wide, with narrowed sides to the neck constriction; antenna thin, long, as long or longer than body, with joints from A4 to A7 subcylindrical, about twice as long as wide (Fig. 36); A4 without or with almost indistinct emargination.

Scutellum, lateral sides of propodeum, and base of T2 at the sides with dense, short, scale-like whitish pubescence; T2 dorsally only with scarce, long, decumbent hairs.

Female: unknown.

REMARKS. A specific separation of *A. longicornis* n. sp. from *A. cavazzutii*, described above, is uncertain, the scarce material making difficult a correct evaluation of a possible intraspecific variation. Some of the morphological characters indicated in keys and description, as the shape of head and antennal joints, seem rather important to maintain at moment this separation. The discovering of females of *A. longicornis* could furnish new, important information about the taxonomic status of these two allopatric, closely allied taxa.

DISTRIBUTION. Tenerife, Taganana region.

11. *Atomopria paglianoi* n. sp.

LOC. TYP.: Spain, Canary Isl., Tenerife: Aguamansa.

TYPE MATERIAL. HT female "Canarie, Tenerife. Aguamansa. 22. III. 1988. A. Casale leg."; PT 1 female, same as holotype (MRSN).

SPECIFIC EPITHET. I wish to dedicate this new species to my good friend Guido Pagliano, well known and estimated specialist of Hymenoptera, for his support in collecting specimens in the forests of Algeria and in other localities.

DESCRIPTION. Female: Body total length: mm 1.50-1.68. Wings absent. Colour mostly reddish brown, with T2 chestnut brownish; head blackish, antennal club dark brown or blackish, legs and antennal joints from A1 to A9 yellow reddish. Head from above elongate, with almost parallel sides; eyes prominent; ocelli

relatively large and distinct; median tooth and lateral projections of frons well developed. Antennal club relatively small (as in *cavazzutii*: see Fig. 27); A10 about as wide as long, A11 weakly transverse. Pronotum, lateral sides of propodeum and petiole with short, dense, whitish pubescence. T2 peculiarly short and wide, with very scarce, decumbent hairs (Fig. 8).

Male: unknown.

REMARKS. Probably close to *A. cavazzutii*, *A. paglianoi* is however markedly distinct from any other *Atomopria* species for the peculiar shape of abdominal T2 and for other characters made evident in both the key and description.

DISTRIBUTION. Canary Islands, Tenerife, Aguamansa. It is noticeable that the only two known females of this species were obtained from a relatively xeric *Pinus* forest, though the other congeneric species in Tenerife were collected in Laurisilva, or in other wet plant association.

12. *Atomopria scaramozzinoi* n. sp.

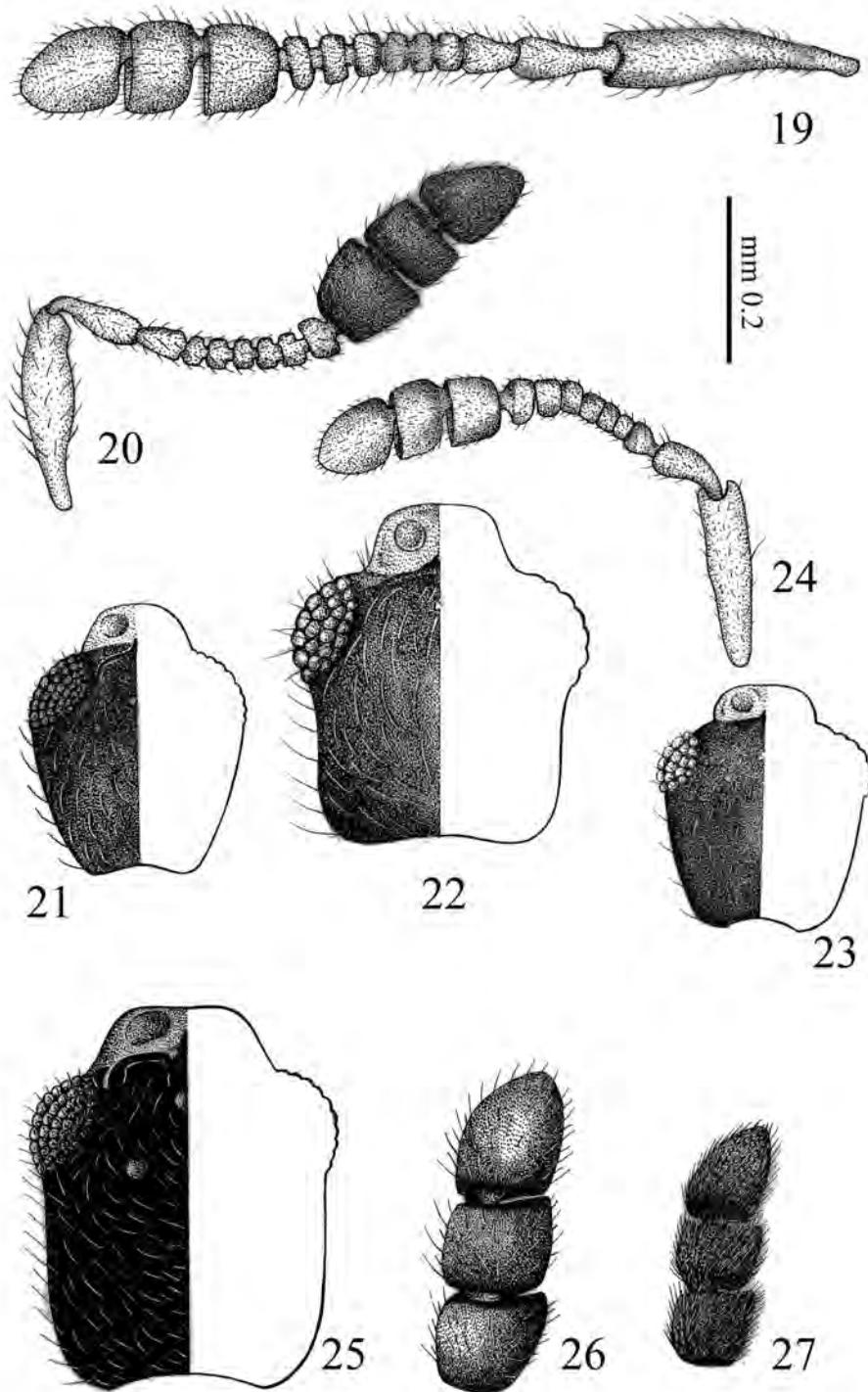
LOC. TYP.: Spain, Canary Isl., Tenerife: Mt. Aguirre.

TYPE MATERIAL. HT female "Tenerife Me Aguirre 6. VI. 1965 R. Arozarena" (MCNT); PT: 1 male "TF Erios.- M. Agua m 1200 23.III:1988. A. Casale leg." (MRSN).

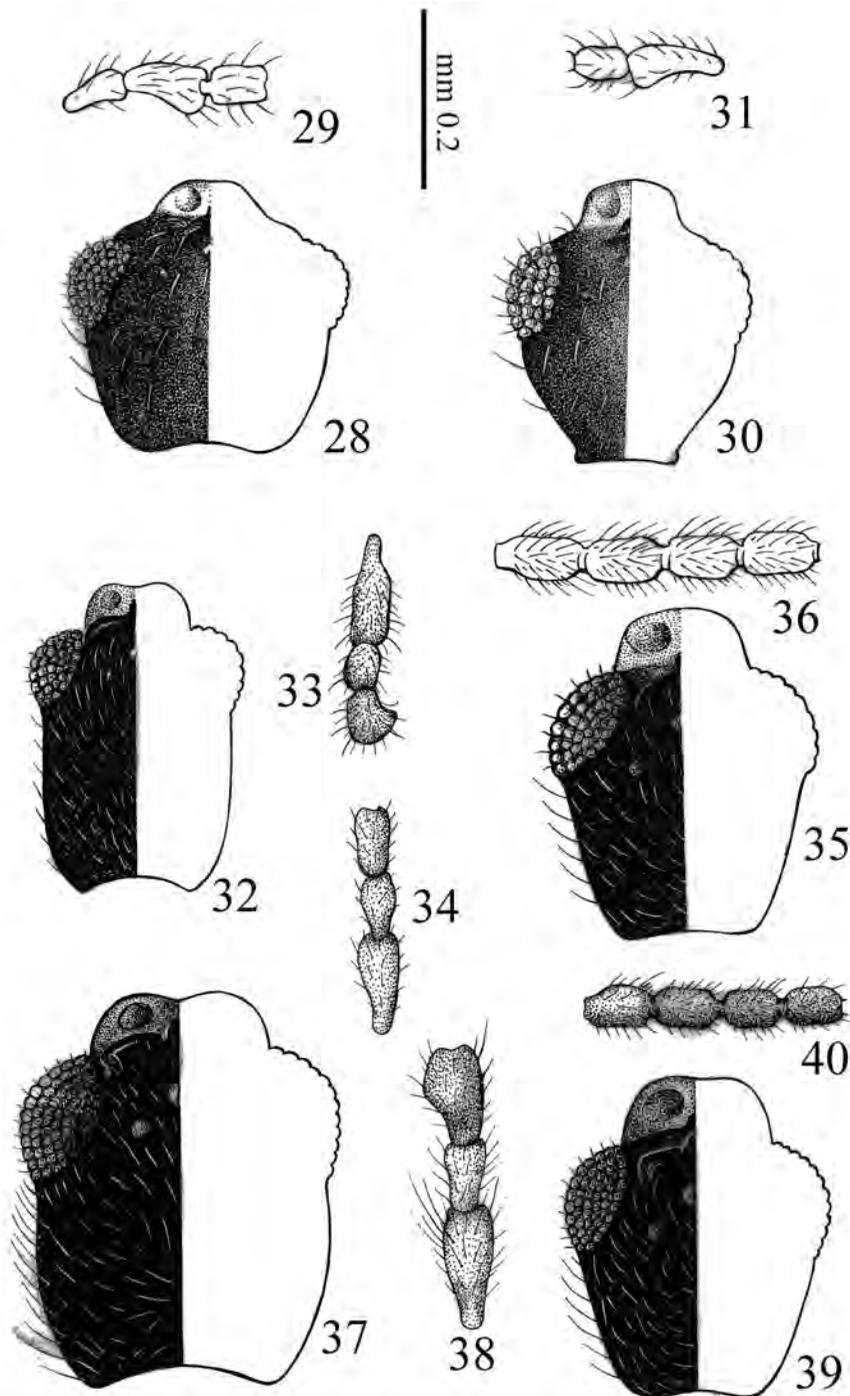
SPECIFIC EPITHET. I wish to dedicate this new species to Pierluigi Scaramozzino, specialist in Hymenoptera Ichneumonidae, former curator of entomological collections at the MRSN, for his support in collecting specimens in Algeria, Canary Islands and in other areas.

DESCRIPTION. Female: Body total length: mm 1.79. Wings absent. Colour mostly reddish, with head, abdominal T2 and antennal club dark brown; legs orange-yellow. Head (Fig. 25) relatively large, sub-rectangular, strongly punctate-pubescent, with parallel lateral sides, bent to the neck constriction. Frons with well developed median tooth and lateral projections. Eyes prominent; ocelli distinct. Antennal club (Fig. 26) very large, subglobose; A11 strongly transverse. Pronotum, lateral sides of propodeum and petiole with rather dense, short, whitish pubescence. Abdominal T2 very large, elongate ovoid, truncate at apex, with relatively long, decumbent hairs.

Male: Body total length: mm 1.81. Agreeing with female in the general characters. Head blackish (Fig. 37). Antennae relatively robust, reddish yellow at the base from A1 to A3, darkened from A4 to A14; A4 (Fig. 38) with a distinct emargination in the basal half.



Figs. 19-27. *Atomopria* spp., females, head in dorsal aspect and antennae. 19: *A. helenae* n. sp., female holotype, antenna; 20: *A. ortegae* n. sp., female holotype, antenna; 21: idem, head; 22: *A. helenae* n. sp., female holotype, head; 23: *A. lisae* n. sp., female holotype, head; 24: idem, antenna; 25: *A. scaramozzinoi*, female holotype, head; 26: idem, antennomeres 10-12; 27: *A. cavazzutii* n. sp., female holotype, antennomeres 10-12.



Figs. 28-40. *Atomopria* spp., males, head in dorsal aspect and antennomeres. 28: *A. giachinoi* n. sp., male paratype, head; 29: idem, antennomeres 3-5; 30: *A. lisae* n. sp., male paratype, head; 31: idem, antennomeres 4-5; 32: *A. boffai* n. sp., male holotype, head; 33: idem, antennomeres 2-4; 34: *A. ortegae*, male paratype, antennomeres 4-6; 35: *A. longicornis* n. sp., male holotype, head; 36: idem, antennomeres 4-7; 37: *A. scaramozzinoi* n. sp., male paratype, head; 38: idem, antennomeres 2-4; 39: *A. cavazzutti* n. sp., male paratype, head; 40: idem, antennomeres 4-7.

REMARKS. Though not collected together, the male and female described above are attributed, with a high degree of probability, to the same species: morphological characters of the two specimens are respectively according, and the localities of found are both located in Teno Massif (NW Tenerife).

DISTRIBUTION. Tenerife, in the north-western Teno massif, collected sifting soil and in pit-traps in Laurisilva forest.

TAXONOMY AND BIOGEOGRAPHIC NOTES

Owing to its morphological features, the genus *Atomopria* is obviously very close to genus *Basalys* Westwood, 1833 (= *Loxotropa* auct. nec Förster), of which it appears as a very apomorphic sister group, or a clade derived from within *Basalys*, i.e. a mere synonym of it.

As for *Basalys*, females of *Atomopria* species have a 12-segmented antennae, with a sharply differentiated club, and males have 14-segmented antennae, with short flagellar hairs.

Apparently, from most species of *Basalys* and related genera, *Atomopria* differs owing to markedly modified morphological characters: in fact, in the latter, the constant micropterous or apterous condition in both sexes has highly influenced some modifications in pterothorax, reducing or vanishing the suture dividing mesoscutum from scutellum; furthermore, in *Atomopria*, the latter is small and without or very reduced basal pit. The *Psilus*-shaped, opisthognathous head, with frontal tooth and lamelliform outgrowths, is very characteristic.

However, there is no satisfactory generic diagnosis for *Atomopria*: the armature of head also occurs in some species of *Basalys* (e.g. in *Acidopria* Kieffer, 1913, synonymized by Masner, 1964). The fact that the scutellum is fused with mesoscutum and the scutellar pit absent or very reduced in size may be due to advanced wing reduction, as observed by Masner (pers. comm.) among micropterous/apterous *Basalys* spp. from soil samples in the New World. Generally, apterism in diapiids results in correlated changes of the pterothorax.

Masner & García (2002) recognized *Basalys* primarily on the unique venation of fore wing, especially the position and the shape of the basal vein. In *Atomopria*, the examination of this character is impos-

sible, owing to the reduction or absence of fore wings.

Therefore, very probably the taxa currently and here attributed to *Atomopria* represent a mere, very derived species group of *Basalys*, but the synonymy of *Atomopria* with *Basalys* (in the widest sense) is not yet proposed in the present contribution.

From the biogeographic point of view, the distribution pattern of these species merits however particular attention: they seem in fact localized each to small, scattered areas along the Western Mediterranean and in the Canary Islands. This should indicate a relict distribution of an ancient phyletic lineage, originally tied to Pliocene subtropical forests, presently limited to the Macaronesian Laurisilva (an evergreen plant association of endemic species as *Laurus novocanariensis*, *Ocotea foetens*, *Persea indica*, *Apollonias barbujuana*, *Ilex perado*, and others) owing to the Pleistocene climatic deterioration.

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