

Two new species of the genus *Alopecosa* (Araneae: Lycosidae) from south-eastern Europe

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Abstract: Descriptions are given of *Alopecosa psammophila* sp.n. and *Alopecosa kalavrita* sp.n. *A. psammophila* comes from the sandy localities in southern Slovakia and southern Moravia; *A. kalavrita* has been found in mountains of southern Greece. The two species are morphologically closely allied, their relations to the European *Alopecosa* species are discussed. In searching for their relations to the eastern Palearctic fauna, *A. pseudohirta* (SCHENKEL, 1963) has been found to be a new synonym of *A. edax* (THORELL, 1875).

INTRODUCTION

The number of known European species of the genus *Alopecosa* is continually increasing. The monograph by LUGETTI & TONGIORGI (1969) contains 25 species. By a careful analysis of variability of *A. aculeata* and *A. accentuata* according to KRONESTEDT (1990) and CORDES & VON HELVERSEN (1990) this number has been increased to 27. A twenty-eighth species has been described from the mountain forests of Greece (CORDES 1996).

The present paper contains descriptions of further two species, *A. psammophila* from sandy localities in southern Moravia and southern Slovakia, and *A. kalavrita* from mountain localities in southern Greece.

At the very beginning, the Moravian population of the psammophilous *Alopecosa* was erroneously considered by RŮŽIČKA (1998) to be *A. edax* (THORELL), especially due to considerable similarity in the shape of the tegular apophysis, as illustrated in PRÓSZYNSKI (1961) and LUGETTI & TONGIORGI (1969). However, a subsequent comparison with the actual holotype of *A. edax* (THORELL) has revealed that there are two quite independent species. On the other hand, an absolute identity has been demonstrated in the structure of male palpi in the type specimens of *A. edax* and *A. pseudohirta* (SCHENKEL). The only known specimen of *A. pseudohirta* is a male

collected in China. This fact supports the suspicion, formulated much earlier, that also the only known male holotype of *A. edax* does not come from the environs of Warsaw, Poland but from the eastern part of the Palaearctic region (STAREGA 1983: 150)

Genus *Alopecosa* SIMON, 1885

The center of occurrence of this genus lies in the eastern part of the Palaearctic Region. Seven species have been reported from Canada, five of which also occur in the Palaearctic; two more species only are known to occur in the more southern parts of North America (DONDALE & REDNER 1990). The catalogue pertaining to the territory of the former Soviet Union lists 74 specific names (MIKHAILOV 1997), additional species have been described from Japan (TANAKA 1992) and China (YIN et al. 1997), recently also from Kazakhstan (ESKOV & MARUSIK 1994) and southern Siberia (LOGUNOV & MARUSIK 1994). However, an indispensable revision comprising all known species is still not available. The existing revisions are of a partial character only and, as a rule, they are limited to the territories of a single country (SONG 1986, TANAKA 1992). In this situation, lacking a division of the known Palaearctic species into natural groups, such as has been done at least on the European scale (LUGETTI & TONGIORGI 1969), it is difficult to consider most of the earlier eastern Palaearctic literary data.

Moreover, the two species newly described from south-eastern Europe show characters typical of two species groups (in the sense of LUGETTI & TONGIORGI 1969). For instance, because of the thin pedicel of their septum which does not fill the whole width of the epigynal pit, these two species could belong to the *Alopecosa sulzeri* group; on the other hand, because of some structures on the male bulbus, they could belong to the *A. striatipes* group where also *A. edax* has been included (LUGETTI & TONGIORGI 1969).

MATERIAL AND METHODS

All measurements are given in millimetres. The numerical code of the mapping grid for the Czech Republic and Slovakia (BUCHAR 1982) is given in brackets for each locality.

Abbreviations: AA – apical apophysis, ALE – anterior lateral eyes, AME – anterior median eyes, PFT – pitfall trapping, PME – posterior median eyes, TA – tegular apophysis.

The studied specimens are deposited in the Institute of Zoology, Polish Academy of Sciences, Warsaw (IZPAN); Museum Nationale d'Histoire Naturelle, Paris (MHNP); National Museum Praha (NMP); Naturhistorisches Museum, Vienna (NMW). Some of the specimens are kept in private reference collections (CB – Collectio Buchar, CR – Collectio Růžička, CTh – Collectio Thaler).

Alopecosa psammophila sp.n. (Figs 1–3, 7, 10–11, 14, 20–22)

Alopecosa edax: RŮŽIČKA 1998, misidentification

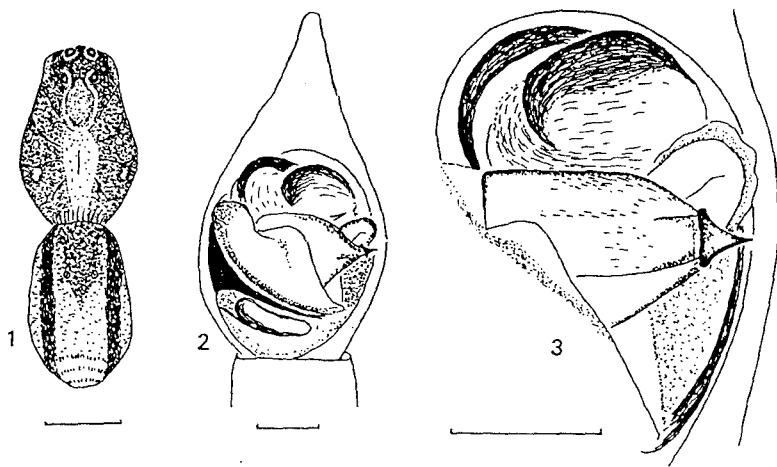
Holotype ♂: Czech Republic, South Moravia, Bzenec, Váté Písky National Nature Monument (aeolian sands) (7069), 2 April 1998, leg. P.Bezdčeka (NMP).

Paratypes: 1♂ with the same data (CR), 1♀ same locality, June 1996, leg. V.Růžička (CR); 6 juv., same locality, 4 May 1997, leg. J.Buchar (CB); 5♀ same locality, 30 April to 30 May 1998 (PFT) leg. P. Bezděčka (CR); 3♀ same locality, 30 May to 14 June 1998 (PTF), leg. P. Bezděčka (NMP).

Other material examined: Slovakia. Čenkov settlement, Čenkovská step (steppe) (8277) sand dune, 1♀, June 1962, leg. J. Buchar (CB).

Diagnosis: *A. psammophila* sp.n. can be readily distinguished from other species of this genus by the shape of its vulva and TA. It is closely related to *A. kalavrita* sp.n. from which it differs in the smaller dimensions, different coloration, the shape of its epigyne, receptacles and TA.

Somatic features: Total length ♂ 8.0, 8.5, ♀ 7.75–10.5 ($n = 11$), carapace length (width) ♂ 4.3, 4.5 (3.3), ♀ 4.1–5.1 (3.2–3.9). Carapace reddish brown with a somewhat paler lateral stripe (indistinct and interrupted in males) and a distinct pale median stripe, its proximal half in males being delimited by a whitish stripe of whitish hairs resembling a lyre in shape (Fig.1). Eye field black, clypeus and sides of the cephalic part are in much the same colour as the median stripe. Carapace abundantly covered with whitish hairs which are more condensed on its circumference. The PME-PME row is wider than the frontal one. ALE smaller than AME. Chelicerae blackish brown, with three prolateral and 2 retrolateral teeth. Sternum dark brown, coxae pale yellow. Abdomen dark grey (paler in males), with an indistinct pattern (in males with two almost black stripes near the sides of the dorsal side, Fig.1), pale grey on ventral side (in one of the female specimens with a large median blackish blotch). Legs pale brown, trochanters and femora blackish grey below, with black longitudinal blotches on dorsal surface, patellae and tibiae darker in colour, with very indistinct blotches. The leg blotches are less distinct in males.



Figs 1–3. *Alopecosa psammophila* sp.n., male (Bzenec, Czech Republic). 1–body in dorsal view; 2–left palp in ventral view; 3–tegular apophysis and apical division. Scales 2 mm (1), 0.3 mm (2, 3).

Male palpus (Figs 2-3, 7, 20-22). Length of cymbium (tibia) 1.75 (0.875). Terminal part of cymbium and bulbus dark brown, apical part of cymbium paler, terminal claw not developed. TA flat, conspicuously tapering towards retrolateral margin of cymbium. Terminal part of TA very complex in structure and bent to the ventral side of bulbus (Fig.7). In ventral view this bend appears in form of a triangular dent. The base of this terminal dent is wider than the terminal part of TA proper (Fig.3). Terminal point of TA (a) is formed by a characteristic curvature of cuticle in form of a basal (b) and a distal (c) cuticular surface (Figs 20-22). The basal surface is considerably less heavily pigmented than the distal one. Both surfaces are mutually distant in the basal part of TA, gradually approximating and fusing on the dorsal side of the terminal point, thus resembling „folded hands“. AA indistinct. Embolus arched, very thin on apical end.

Epigyne (Figs 10-11) is covered with long whitish hairs. Septum characterised by a narrow anterior part that does not fill the corresponding part of the epigynal pit. Marked nodules of ducts in form of minute rings show through the sides of epigynal pit. Vulva characterised by spherical seminal receptacles. Their size is approximately the same as the heavily concentrated nodules of their ducts (Fig.14).

Affinities: Evidently, *Alopecosa psammophila* sp.n. belongs among those species which LUGETTI & TONGIORGI (1969) included in the *striatipes* and *sulzeri* groups of the genus *Alopecosa*. The general appearance of its TA resembles that of *Alopecosa schmidtii* (HAHN), *A. edax* (THORELL) and also *A. kalavrita* sp.n. As for the conspicuous terminal narrowing of TA, it occurs even in species of the *sulzeri* group: in *A. alpicola* (SIMON) and partly also *A. lacinosa* (SIMON). In all the above species of both groups the narrowed part of TA is bent to the ventral side (Figs 7-9), whereas in the remaining species, as illustrated by LUGETTI & TONGIORGI (1969), the distal part of TA has a quite different form. In most cases it is very wide even in its distal part, as seen in *A. sulzeri* (PAVESI), *A. striatipes* (C.L. KOCH), *A. solitaria* (HERMAN). A somewhat transitory situation is found in *A. mariae* (DAHL) and *A. taeniopus* (KULCZYNSKI) in which the TA is also very wide but, in lateral view, it shows the characteristic structure of „folded hands“, readily observed when the object is suitably turned, like in all species showing a conspicuous narrowing of this apophysis. Here it is well visible in Figs 8, 21, 22, in LUGETTI & TONGIORGI (1969) in Figs 20c, 21c, 23c, 24b and 25c.

As for the shape of the epigyne, *A. psammophila* could be included in the *sulzeri* group in view of the narrow stalk of its epigynal septum which does not fill the whole bottom of the pit. On the other hand, the complicated coils of its receptacle ducts rather resembles the situation found in the *striatipes* group.

A. psammophila distantly resembles two species, *A. akkolka* and *A. saurica*, recently described from eastern Kazakhstan (ESKOV & MARUSIK 1994). Only females are known of the two species. The first one may be included in the *sulzeri* group by the form of its epigyne and vulva (the stalk of the epigynal septum being very short and wide yet still not filling the epigynal pit; the receptacle duct being very short and simple). In the second species the septum is very short and narrow but fills the whole epigynal pit, as

is typical of species in the *striatipes* group. In this species the seminal receptacles have very short ducts so that they lie on the level of the epigynal septum stalk. It is worthwhile to note the total length of the former species (17.5–22 mm). All the above mentioned characters are in direct contrast with those of *A. psammophila*.

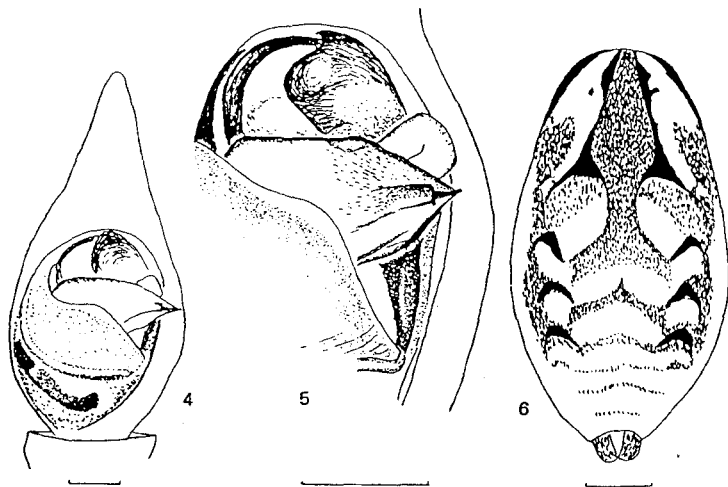
***Alopecosa kalavrita* sp.n. (Figs 4-6, 8, 12-13, 15)**

Alopecosa sp.: THALER, BUCHAR & KNOFLACH 2000, Figs 7-9, habitus photographs

Holotype ♂: Greece, Peloponnese, Ahaia: Erymanthos Mts., Olonos, alpine zone, 2000–2200 m, leg. K. Thaler (NMW).

Paratypes: 1♂ 2♀ with the same data (CB, CTh).

Other material examined: Greece, Peloponnese, Ahaia: Mt. Helmos, 2300 m, 1♂, 18 Sept. 1993 (NMW). Above Kalavrita 1400 m, in a Greek fir forest, 1♀, 20 Sept. 1993 (NMW), both specimens leg. K. Thaler.

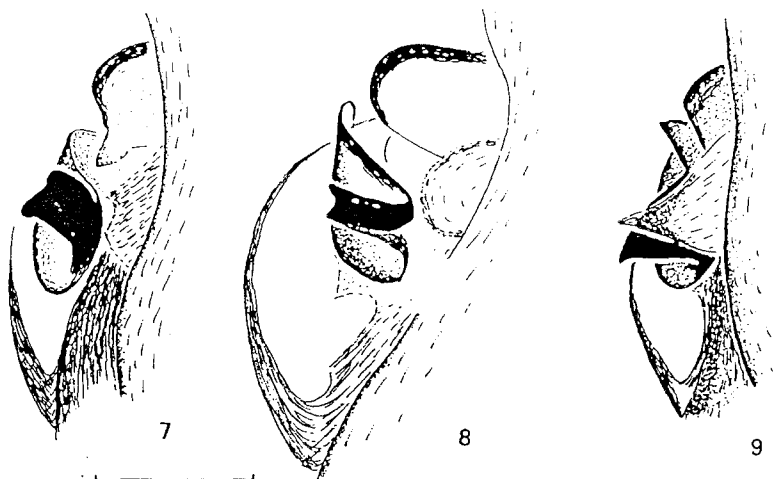


Figs 4–6. *Alopecosa kalavrita* sp.n., male (Olonos, Greece). 4–left palp in ventral view; 5–tegular apophysis and apical division; 6–opisthosoma in dorsal view. Scales 0.3 mm (4, 5), 1 mm (6).

Diagnosis: *A. kalavrita* sp.n. is closely related to *A. psammophila* sp.n.; see the similar TA and epigynal septum with a narrow stalk but with a different shape of the epigynal field, and the oval seminal receptacles.

Somatic features: Total length ♂ 10.5, ♀ 15.8–16.6 ($n = 2$), length (width) of prosoma ♂ 6.0 (4.4), ♀ 6.5–7.0 (5.0–5.7).

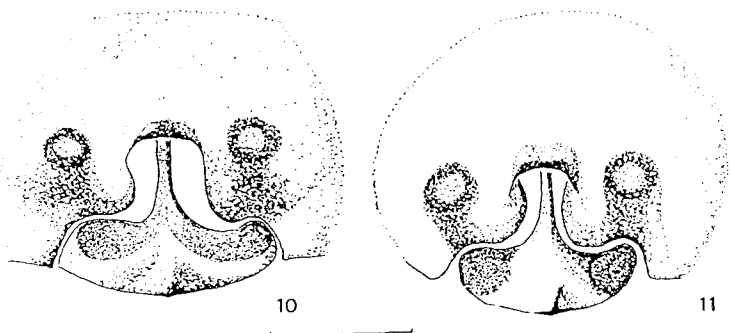
Male: Carapace pale yellowish brown, longitudinal stripes brown including the eye field, the latter being covered with short, whitish hairs. The PME–PME row is wider than the frontal row. ALE are smaller than AME. Front of carapax and chelicerae blackish brown. Chelicerae prolaterally with three teeth, retrolaterally with two teeth. Sternum, labium and cymbium of palpus dark brown. Coxae and femora yellowish on



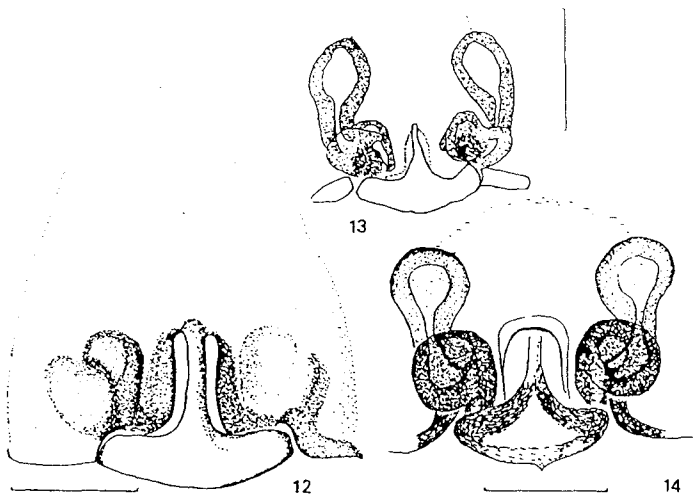
Figs 7-9. Left palp, tegular apophysis and apical division in retrolateral view. 7-*Alopecosa psammophila* sp.n., male (Bzenec, Czech Republic); 8-*Alopecosa kalavrita* sp.n., male (Olonos, Greece); 9-*Alopecosa schmidtii* (HAHN, 1834), male (Klánovice, Czech Republic). Scale 0.3 mm.

ventral side. Remaining parts of legs and palpi pale brown. Femora on dorsal side with indistinct brownish blotches. Dorsal side of opisthosoma pale grey with a feeble pinkish tinge and with the characteristic pattern of many species of this genus consisting of whitish and blackish brown blotches (Fig.6). Posterior half of opisthosoma with a dense cover of short whitish hairs, ventral side of abdomen blackish grey.

Female: Coloration similar to that of the male yet no whitish hairs are developed in the eye field and on the dorsal side of the abdomen. In contrast to the male, females show in the anterior part of the median longitudinal stripe a pair of stripes consisting of dark hairs (Fig.15). In the anterior part of the eye field, numerous and fairly long and strong bristles are present, pointing anteriorly. Legs somewhat darker, coloration of



Figs 10-11. *Alopecosa psammophila* sp.n., epigyne. 10-Bzenec, Czech Republic; 11-Čenkov, Slovakia. Scale 0.3 mm.



Figs 12–14. Epigyne/vulva. 12, 13—*Alopecosa kalavrita* sp.n. (Olonos, Greece); 14—*Alopecosa psammophila* sp.n. (Bzenec, Czech Republic). Scales 0.3 mm (12, 14), 0.5 mm (13).

abdomen less contrasting. The darkest blotches on the dorsal side of abdomen are brown. Ventral side of abdomen very pale blackish grey. The female from Kalavrita is somewhat darker in coloration but this is not true of the ventral side of its abdomen.

Male palpus (Figs 4-5, 8): Length of cymbium (tibia) 2 (1.4). TA flat, conspicuously tapering towards retrolateral margin of cymbium. Terminal part of TA in apical view shows a marked curvature in the ventral direction (Fig.8). On the ventral side this curvature appears in form of a narrow point arising from a narrow base, the latter being much narrower than the corresponding part of TA (Fig.5). AA present in form of an indistinct lobule. Embolus arched, very thin on apical end.

Epigyne small, particularly as compared with the extensive epigynal field, covered with long hairs. Septum with a long and slender anterior pedicellar part, lateral pits distinct, anterior pocket-like formation with two lobes (Fig.12). Seminal receptacles oval and almost twice the size of the nodosity of their ducts (Fig.13).

Affinities: *Alopecosa kalavrita* sp.n. shows the closest relations to *A. psammophila* sp.n. described above, yet it distinctly differs from it in larger size, general coloration, and structure of copulatory organs:

	<i>A. psammophila</i>	<i>A. kalavrita</i>
Length of prosoma	4.0–5.0	6.0–7.0
Dorsal pattern of opisthosoma	Fig. 1	Fig.6
Length of epigynal area/length of epigynal septum	0.2	0.3
Anterior hood	monolobed	bilobed
Length of tibia/length of cymbium	0.5	0.7
Form of receptacle	circular	oval
Form of distal part of TA	wider than TA	narrower than TA

Habitat and distribution: The specimens were taken in the mountains of northern Peloponnese, mostly in stony fields and slopes of the alpine zone, in 2000-2300 m above the *Abies cephalonica* forest; 1♀ in the forest belt at 1400 m (THALER, BUCHAR & KNOFLACH 2000).

APPENDIX

Since significant relations of *A. psammophila* sp.n. to *A. edax* (THORELL) and to *A. pseudohirta* (SCHENKEL) were observed during earlier author's determination, type specimens of the latter two species were borrowed for the purpose of mutual comparison. So far, a single specimen is known of each of them. The following is the result of the comparison:

Alopecosa edax (THORELL) (Figs 16–19)

Tarentula edax THORELL, 1875: 150

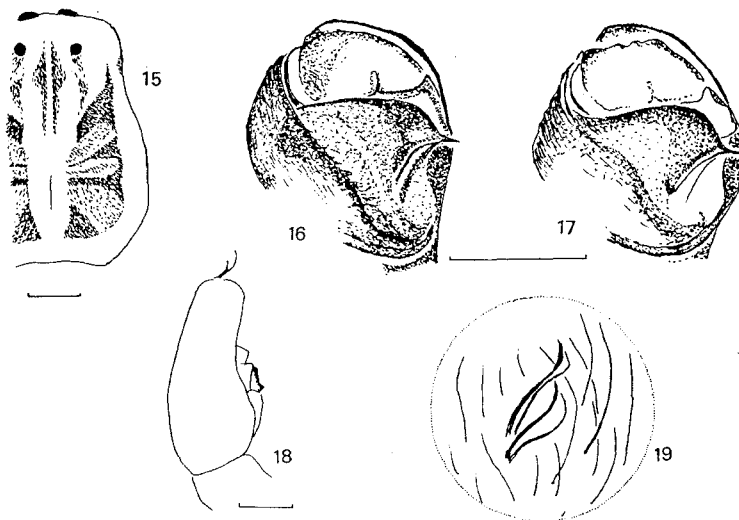
Tarentula (Alopecosa) edax: PRÓSZYNSKI, 1961: 125-127, Figs 1-6

Tarentula pseudohirta SCHENKEL, 1963: 309, Fig. 176

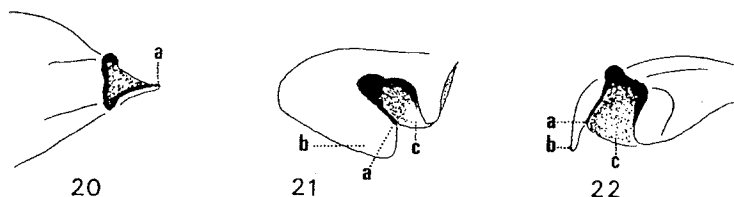
Alopecosa edax: LUGETTI & TONGIORGI, 1969: 89, Fig. 26 a-c

Alopecosa pseudohirta: SONG, 1986: 77, Fig. 13

Material examined: *Alopecosa edax* (THORELL, 1875) male holotype, collection of W. Taczanowski, „Varsavia, Polonia“ (24) (IZPAN). *Alopecosa pseudohirta* (SCHENKEL, 1963) male holotype, China, Kansu, Dshanba River valley, 2 April 1885, collection of Potanin (103) (MHNP).



Figs 15–19. 15–*Alopecosa kalavrita* sp.n., female, prosoma in dorsal view. *Alopecosa edax* (THORELL, 1875), male bulbus of left palp in ventral view: 16–holotype „Varsavia, Polonia (!)“; 17–Kansu, China; 18–tarsus of right pedipalp in inner view (Kansu); 19–bristles on the apex of the same pedipalp in more apical view (Kansu). Scales 1.5 mm (15), 0.3 mm (16–18).



Figs 20–22. *Alopecosa psammophila* sp.n., male (Bzenec, Czech Republic). 20–apical part of TA in ventral view (as in Fig. 3); 21, 22 – the same in different views, schematically. Explanations: a–terminal tooth of TA; b–basal part of cuticle of terminal tooth; c–distal part of cuticle of terminal tooth.

Both specimens are of the same size, disproportionately small; in comparison with the central European species of the *sulzeri* and *striatipes* groups. Length of carapax 3.5, the same value being stated by PRÓSZYNSKI (1961), SCHENKEL (1963) and LUGETTI & TONGIORGI (1969). According to data in LUGETTI & TONGIORGI (1969), the dimensions of all known central European species of the above mentioned two species groups vary between 4.0 (a single species, *A. alpicola*, 4.0–5.2) and 7.5, most species measuring 5.0 and over.

The shape of TA in the same view (Figs 16–17) is identical in both specimens examined.

A. edax differs from all known European species of the genus *Alopecosa* in having a short cymbium (Fig. 18) with unusually shaped terminal claws (Figs 18–19). The small size, shape of cymbium and terminal bristles replacing terminal claws indicate that *A. edax* may not be an element in the European fauna of the genus *Alopecosa*.

CONCLUSIONS

Alopecosa psammophila sp.n. is the sixteenth species of that genus recorded in the territory of the Czech Republic (BUCHAR 1995, 1996, 1999), while *A. kalavrita* sp.n. is one of five species documenting the presence of that genus in the territory of Greece (THALER, BUCHAR & KNOFLACH 2000). Although further species may be expected to be discovered in the territory of Greece, the scarce representation of this genus in that part of the Mediterranean is rather conspicuous.

Adding the two newly described species and subtracting *A. edax*, a species alien to the European fauna, 30 species of the genus *Alopecosa* are known in Europe at present. In that number, the Czech fauna participates by over 50 %, in contrast to a mere 17 % of the Greek one for the time being.

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