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Contribution to the knowledge of European Bourletiellidae (Collembola, Symphypleona). II. Redescription of three species and description of three new species of *Fasciosminthurus*.

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Contribution to the knowledge of European Bourletiellidae (Collembola, Symphypleona). II. Redescription of three species and description of three new species of *Fasciosminthurus*.- A further information is given on the following species of *Fasciosminthurus*: *F. cugnyi* (Nayrolles, 1987), *F. quinquefasciatus* (Krausbauer, 1902), and *F. raynalae* (Nayrolles, 1987). Three new species are described: *F. bedosae* n. sp., *F. cassagnaui* n. sp., and *F. longisetus* n. sp.

Key-words: Collembola - Symphypleona - Bourletiellidae - *Fasciosminthurus* - new species - Europe.

The appendicular chaetotaxy - included its ontogeny - of six European species belonging to the genus *Fasciosminthurus* Gisin, 1960, *sensu* Bretfeld, 1992 is described according to a standard, as table-form, already displayed in a previous paper (NAYROLLES 1993). Concerning the chaetotaxy of the rest of the body, only the trichobothrial pattern and setae on the small abdomen were studied. The trichobothrial pattern is described from BETSCH & WALLER (1989) criteria. Trichobothria A, B, and C emerge at second instar, and D and E are primary. The antennal chaetotaxic variables, *h**, *ISh**, and *RSh* are explained in NAYROLLES (1993). The type of setal ontogeny (see NAYROLLES 1993) is given by letters: P = primary seta, D = seta of 2nd instar, T = seta of 3rd instar, and Q = seta of 4th instar (adult in Bourletiellidae). When a seta is variable at the instar in which it appears, the letters that symbolizes this instar is written between parentheses; if in a latter instar it becomes constant, this instar is given as well. All the species were collected in the South of France and in the North-East of Spain.

The following abbreviations are used: abd. = abdomen — ad. = adult — an. app. = anal appendage — ant. = antennal segment — ceph. diag. = cephalic diagonal — cup = cup-like organ — juv. = juvenile — ov. org. = oval organ — st. = instar.

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The material is deposited in the following data-collections: Laboratoire d'Ecologie des Invertébrés Terrestres, Université Paul Sabatier, Toulouse, France (LEITT) — Muséum d'Histoire Naturelle de Genève, Switzerland (MHNG) — Muséum National d'Histoire Naturelle, Paris, France (MNHN) — Instituut voor Taxonomische Zoölogie (Zoologisch Museum) Universiteit van Amsterdam, the Netherlands (ZMA).

Fasciosminthurus quinquefasciatus (Krausbauer, 1902) (Figs 1-2; Table I)

Material

Collected in several places in the South-West of France and in the North-East of Spain; collected with a net. 12 juv. and 10 ad. mounted.

Deposit of material. — All the material in LEITT.

Description

Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.6 - 0.65 mm; ♀: 0.6 - 0.85 mm.

Color. — Very characteristic, with white cross stripes on dark background. Great abd. with a pair of very lateral white spots in posterior area, small abd. with another pair on abd. V (as in *F. cugnyi*). Both spots on abd. V can be joined with two light circular spots often present on the upper anal flap. Literature provides good drawings of this species (especially JEANNENOT 1956).

Great abd. — Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae. — Antennal ratios: in ♀, ant. I : II : III : IV = 1 : 1.9 : 2.8 : 5.7 and ant.: ceph. diag. = 1.5 ; in ♂, ant. I : II : III : IV = 1 : 2.0 : 2.9 : 6.2 and ant. : ceph. diag. = 1.6. Chaetotaxic variables: for *G*: m = 91.6 / min = 86 / max = 96 ; m(*ISh**) = 0.81 ; m(*RSh*) = 0.51.

FIGS 1-6

Figs 1-2: *Fasciosminthurus quinquefasciatus* (Krausbauer, 1902) ad.; 1: praetarsus, tibiotarsus and femur of hindleg, anterior view. On the femur, arrows point at setae ai3 and ai4 which are lacking in *raynalae* (compare with fig. 3); 2: schematic representation of hindtibiotarsus in anterior view (from fig. 1), setae of Ge and Gi as well as the ov. org. are drawn, other setae are schematized as follows: a full symbol for a seta on reader's side (thus on anterior side), an empty symbol for a seta on opposite of reader's side, a ring for a primary seta, a triangle for a secondary seta, the setae belonging to a same whorl are linked together by a line which is continuous on the anterior side and discontinuous on the other side.

Figs 3-6: *Fasciosminthurus raynalae* (Nayrolles, 1987) ad.; 3: praetarsus, tibiotarsus and femur of hindleg, anterior view; 4: schematic representation of hindtibiotarsus in anterior view (from fig. 3), same legend as in fig. 2; 5: ant. III, anterior view; 6: schematic representation of fig. 5, setae of Ge and Gi are drawn as those of antennal III organ (Xe, Xi) and its guard setae (Aai, Api, Ape), other setae are schematized as follows: a full symbol for a seta on reader's side (thus on anterior side), an empty symbol for a seta on opposite of reader's side, a ring for a primary seta, a triangle for a secondary seta, the symbols of secondary setae belonging to a same generatrix are linked together by a line which is continuous on the anterior side and discontinuous on the other side.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. 2+2 ov. org. behind the head. Labral formula: 6/5-5-4.

Legs (figs 1-2). — Femur: cup present. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 8, 11, 9. Claw with a tooth on its inner crest. Empodial filament thick, S-curved, clavate, and overhanging the claw.

Ventral tube. — Sacs warty from 2nd st. Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

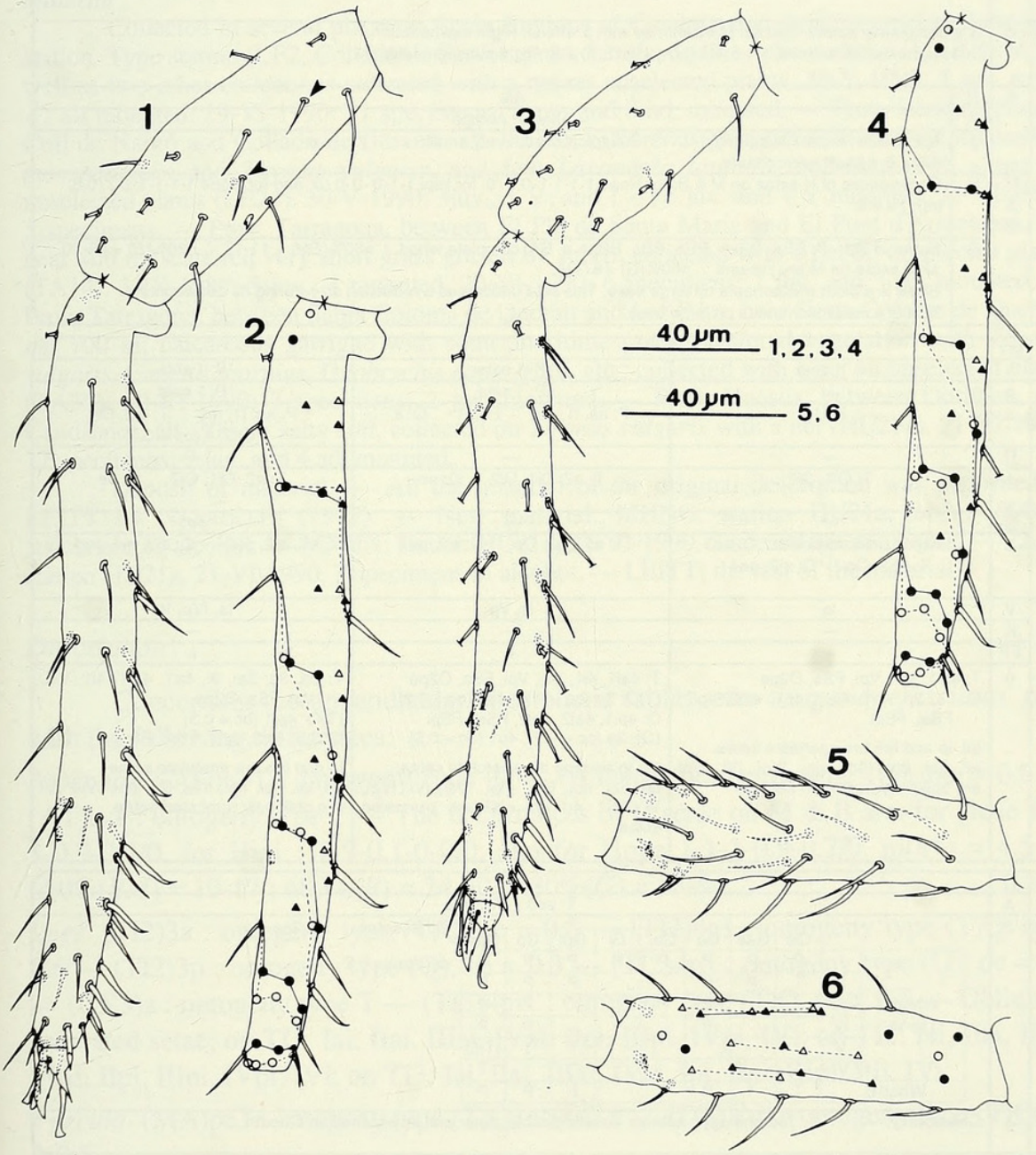


Table I. Appendicular chaetotaxy of *Fasciosminthurus quinquefasciatus*

AP Δ —

AD ∏ —

Δ D: i0 T: i+1 (T)Q: e+1 (oc = 0.8) Q: i-1, pe+1

Ai is a trichobothrium.

AT ∏ —

Δ

	Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Setae -1	Q	T		T	T	T	T	T
Setae 0	Q	D	D	Q	D	D	T	D
Setae +1		T		T	(T)Q		Q	T

Other setae: Q: pe+2, pe+3

oc(i+1) = 0.6

AQ str B is completely zoned. Section M euwhorled with 5 whorls. Right euwhorlation.
Subsegmentation formula: 1 + 5 + 1 = (A) + (M1, 5) + B. Right subsegmentation.

A ∏ Ala

H Allleae, Alllppe

Δ Apical bulb: in part invaginated Subapical organ: very small D: Alai
Allpe is a blunt microchaeta

M & B H Occurrences of H setae on M & B: for Heae 1-1-1-1-0.6 / 0, for Hipi 1-1-0-0-0 / 0, and for Hppe 1-1-1-1-0.7 / 0.3.
m(*h*") = 4.8.

G Setae of BB: P: BBe, BBae, BBa, BBp, BBpe / BA: complete whorl / n80%(*BM*) = 11-17 / n80%(*B*) = 23-30 / all G setae on M are present / n80%(*G*) = 87-94.
BBae is a blunt microchaeta on large base. This seta undergoes a reduction size during its development.
BBa is a cucumiform seta on large base.

SB	prc	—	—	—
	Δ	P: 1 seta	P: 1 seta	P: 1 seta
SA	Δ	—	P: 1 seta	P: 1 seta
CX	Δ	P: i1	P: ae, i1, ms T: Oi1 Q: a	P: ae, i1, ms T: ai2, Oi1 (T)Q: a (oc = 0.7)
TR	∏	—	—	—
	Δ	T: Oi1, Oi2	T: a2, Oi1, Oi2 Q: ae	T: a2, Oi1, Oi2 Q: ae
FE	∏	—	—	pe1
	Δ	delayed primordial seta: Q: ae3 T: pe2, Op Q: ai2, pe4	T: a5, pe2, Op Q: ai2, pe4	T: a5, ai2, pe2 Q: ai3, ai4, pe4, Oi
TI	V	la	la, Vp	la, IVp, Vp
	K	—	—	—
	FP	+	+	+
	Δ	T: 4ai1, Vai, Vpi, FSa, O2pe Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, 4pi2, FSai, FSpi lpi, lp and lpe are spatulate setae. lai, llai, llpi, lllai, lllpi, IVai, IVi, IVpi are obliquely truncated setae.	T: 4ai1, 4i1, Vai, Vpi, FSa, O2pe (T)Q: 3a (oc = 0.7), 4a1 (oc = 0.8) Q: 4pi1, 4ai2, 4pi2, FSai, FSpi (Q): 3p (oc = 0.7), 4p1 (oc = 0.5) lpi, lp and lpe are spatulate setae. lai, llai, llpi, lllai, lllpi, IVai, IVi, IVpi, Vi, 4ai1, 4i1 are obliquely truncated setae.	T: 2a, 3a, 3ai, 3i, 4a1, 4ai1, 4i1, Vai, Vpi, FSa, O2pe (T)Q: 4pi1 (oc = 0.3) Q: 3pi, 4ai2, 4pi2, FSai, FSpi lp and lpe are spatulate setae. lai, lpi, llai, llpi, lllai, llli, lllpi, IVai, IVi are obliquely truncated setae.

MA ∏ —

Δ T: pe3 Q: pe2

DE Δ

		Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Whorls I to VI	I	P	P	P	P	P	P	P	P
	II		P	P			P	P	P
	III			P				P	P
	IV			P				P	P
	V						T	T	(T)Q
	VI.						Q		T
Whorl B		T		P			P	P	P

Other setae: P: 2pe

oc(Vpe) = 0.2

MU Δ Chaetotaxy: — Morphology: anterior lamella double, outer and inner lamellae smooth.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and another one in ad.

Furcula. — Generatrix Gpi on dens with IIIpi and IVpi lacking.

Small abd. — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 16-18 setae. An. app. spine-like, straight. Ratio an. app. : mucro = 0.55.

Fasciosminthurus cugnyi (Nayrolles, 1987)

Material

Collected in several places in Spain (regions of Cataluña and Aragon), included the type station. Type station (LE2, Collado de Perves, prov. Lérida, Spain): type material (4-VII-1986) as well as two other collections collected with a net on unselected plants. 30-V-1990: 5 juv. and 1 ♂; all mounted. 19-VI-1990: 21 specimens; 7 juv. and 8 ad. mounted. — Prov. Lérida, between Coll de Nargó and Collado de Bóixols, alt. 900 m; calcareous garrigue with many *Aphyllanthes monspeliensis* and *Thymus vulgaris*, and few *Lavandula latifolia*; collected with a net on unselected plants (LE24). 30-V-1990: 3juv., 1 ♀, and 1 ♂; 3 juv. and 1 ♀ mounted. 19-VI-1990: 5 specimens. — Prov. Tarragona, between El Pla de Santa Maria and El Pont d'Armentera, alt. near 400 m; scattered very short grass grazed by sheep; collected with a net on unselected plants (TA14). 3-IX-1987: 5 juv.; 1 mounted. 20-VI-1990: 6 specimens; 1 juv. and 3 ad. mounted. — Prov. Tarragona, between Santa Coloma de Queralt and Les Piles, near Santa Coloma de Queralt, alt. 700 m; calcareous garrigue with some maritime pines, scattered vegetation with *Thymus vulgaris*, *Genista scorpius*, *Onobrychis caput-galli*, etc.; collected with a net on unselected plants (TA30). 20-VI-1990: 7 specimens; 2 juv. mounted. — Prov. Huesca, between Ontiñena and Candasnos, alt. 300 m; salty soil, collected on *Thymus vulgaris* with a net (HU21a). 21-VI-1990: 17 specimens; 2 juv. and 4 ad. mounted.

Deposit of material. — All the material of the original description was deposited in LEITT by NAYROLLES (1987). — New material: MHNG: station HU21a, 21-VI-1990, 5 specimens in alcohol. — MNHN: station HU21a, 21-VI-1990, 3 specimens in alcohol. — ZMA: station HU21a, 21-VI-1990, 3 specimens in alcohol. — LEITT: the rest of the material.

Description

Concerning the appendicular chaetotaxic table, refer to *quinquefasciatus*' one, with the following differences:

Antennae. (AD)e+1 : ontogeny type T — (AT)e0 : ontogeny type (Q), oc = 0.8 — (AT)i+1 : ontogeny type T — The occurrences of H setae on M & B are: for Heae 1-1-1-0.9-0.4/0, for Hipi 1-0.9-0.1-0-0/0, and for Hppe 1-1-1-0.9-0.7/0. m(h*) = 4.5 — n80%(BM) = 10-17 ; n80%(B) = 24-30 ; n80%(G) = 88-94.

Legs. (TI2)3a : ontogeny type (T)Q, oc = 0.8 — (TI2)4a1 : ontogeny type (T)Q, oc = 0.6 — (TI2)3p : ontogeny type (Q), oc = 0.3 — (TI2)4p1 : ontogeny type (Q), oc = 0.7 — (CX3)a : ontogeny type T — (TI3)4pi1 : ontogeny type (T)Q, oc = 0.5 — Obliquely truncated setae, on TI1: Iai, IIai, IIIai, IVai, IIpi, IIIpi, IVpi, IVi; on TI2: Iai, IIai, IIIai, IVai, IIpi, IIIpi, IVpi, IVi; on TI3: Iai, IIai, IIIai, IVai, Ipi, IIpi, IIIpi, IIIi, IVi.

Furcula. (MA)pe3 : ontogeny type (T)Q, oc = 0.8 — (DE)Vpe : ontogeny type (T)Q, oc = 0.5.

Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.5 - 0.7 mm; ♀: 0.6 - 1.1 mm.

Color. — I give a supplement of the original diagnosis (NAYROLLES 1987). Very often four light spots take place behind the great abd., two being very lateral. The other two correspond to pure white spots probably composed of uric crystals. Their whiteness contrasts with the very dark background.

Great abd. — Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae. — Antennal ratios: in ♀, ant. I : II : III : IV = 1 : 1.9 : 2.7 : 5.5 and ant. : ceph. diag. = 1.5 ; in ♂, ant. I : II : III : IV = 1 : 2.0 : 2.9 : 6.0 and ant. : ceph. diag. = 1.5. Chaetotaxic variables: for *G*: m = 90.0 / min = 85 / max = 95 ; m(*ISh**) = 0.74 ; m(*RSh*) = 0.48.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. 2+2 ov. org. behind the head. Labral formula: 6/5-5-4.

Legs. — Femur: cup present. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 8, 8, 9. Claw with a tooth on its inner crest. Empodial filament thick, S-curved, clavate, and overhanging the claw.

Ventral tube. — Sacs warty from 2nd st. Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and another one in ad.

Furcula. — In the original description of *F. cugnyi* (NAYROLLES 1987), the drawing of furcula corresponds to an aberrant specimens, so it being to be not considered.

Small abd. — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 17-18 setae. An. app. spine-like, straight. Ratio an. app. : mucro = 0.58.

Fasciosminthurus raynalae (Nayrolles, 1987) (Figs 3-6; Table II)

Material

Type material as well as several specimens collected in June and July 1990 in the type station (Plateau of Aumar, Massif of Néouvielle, dép. Hautes-Pyrénées, France); collected with a net. 14 juv. and 17 ad. mounted.

Deposit of material. — All the material of the original description was deposited in LEITT by NAYROLLES (1987). — New material: MHNG: type station, 5-VII-1990, 5 specimens in alcohol. — LEITT: the rest of the material.

Description

Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.45 - 0.55 mm; ♀: 0.5 - 0.7 mm.

Color. — Refer to the original description.

Great abd. — Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae (figs 5-6). — Antennal ratios: in both sexes, ant. I : II : III : IV = 1 : 1.9 : 2.7 : 5.1; ant. : ceph. diag. = 1.5 in ♀ and 1.6 in ♂. Chaetotaxic variables: for *G*: m = 84.5 / min = 81 / max = 89 ; m(*ISh**) = 0.58 ; m(*RSh*) = 0.43.

Table II. Appendicular chaetotaxy of *Fasciosminthurus raynalae*

AP	Δ	—
AD	Π	—
	Δ	D: i0 T: i+1 Q: i-1, e+1, pe+1 Ai is a trichobothrium.
AT	Π	—
	Δ	Other setae: — oc(e-1) = 0.3

	Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Setae -1	(Q)	T		T	Q	Q	T	T
Setae 0		D	D	Q	D	D	T	D
Setae +1		Q		T	Q		Q	T

AQ	str	B is completely zoned. Section M euwhorled with 5 whorls. Right euwhorlation. Subsegmentation formula: 1 + 5 + 1 = (A) + (M1, 5) + (B). Right subsegmentation.
	A Π	Alp
	H	Allleae, Alllppe
	Δ	Apical bulb: in part invaginated Subapical organ: very small D: Alai Allpe is a blunt microchaeta
	M & B H	Occurrences of H setae on M & B: for Heae 1-1-1-1-0 / 0, for Hipi 0-1-1-0-0 / 0, and for Hppe 1-1-1-0-0 / 0. m(*h*") = 3.5.
	G	Setae of BB: P: BBe, BBae, BBa, BBp, BBpe / BA: complete whorl / n80%(*BM*) = 6-11 / n80%(*B*) = 18-24 / all G setae on M are present / n80%(*G*) = 82-88. BBae is a blunt microchaeta on large base. This seta undergoes a reduction size during its development. BBa is a cucumiform seta on large base.

SB	prc	—	—	—
	Δ	P: 1 seta	P: 1 seta	P: 1 seta
SA	Δ	—	P: 1 seta	P: 1 seta
CX	Δ	P: i1	P: ae, i1, ms T: Oi1 Q: a	P: ae, i1, ms T: a, ai2, Oi1
TR	Π	—	—	—
	Δ	T: Oi1, Oi2	T: a2, Oi1, Oi2 Q: ae	T: a2, Oi1, Oi2 Q: ae
FE	Π	—	—	pe1
	Δ	delayed primordial seta: Q: ae3 T: pe2, Op Q: pe4	T: a5, pe2, Op Q: pe4	T: a5, ai2, pe2 Q: pe4, Oi
TI	V	Ia	Ia, Vp	Ia, IVp, Vp
	K	—	—	—
	FP	+	+	+
	Δ	T: 4ai1, Vai, Vpi, FSa, O2pe Q: 3a, 3p, 4a1, 4pi1, 4ai2, 4pi2, FSai, FSpi (Q): 4p1 (oc = 0.5) Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVpi are obliquely truncated setae.	T: 4ai1, 4i1, Vai, Vpi, FSa, O2pe Q: 3a, 4a1, 4pi1, 4ai2, FSai, FSpi (Q): 4pi2 (oc = 0.8) Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVi, IVpi are obliquely truncated setae.	T: 3ai, 3i, 4ai1, 4i1, Vai, Vpi, FSa, O2pe Q: 2a, 3a, 4a1, 4pi1, 4ai2, 4pi2, FSai, FSpi Ip and Ipe are spatulate setae. Iai, Ipi, IIai, IIpi, IIIai, IIIi, IIIpi, IVai, IVi are obliquely truncated setae.

MA	Π	—
	Δ	(T)Q: pe3 (oc = 0.4)
DE	Δ	Other setae: P: 2pe oc(VIpe) = 0.6

		Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Whorls I to VI	I	P	P	P	P	P	P	P	P
	II		P	P				P	P
	III			P				P	P
	IV			P				P	P
	V						T	T	
	VI						Q		(T)Q
Whorl B		T		P			P	P	P

MU	Δ	Chaetotaxy: — Morphology: anterior lamella double, outer and inner lamellae smooth.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. No ov. org. behind the head. Labral formula: 6/5-5-4.

Legs (figs 3-4). — Femur: cup present. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 7, 8, 9. Claw with a tooth on its inner crest. Empodial filament thick, S-curved, clavate, and overhanging the claw.

Ventral tube. — Sacs probably warty from 2nd st. (unrealized observation). Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and another one in ad.

Furcula. — pe2 of manubrium lacking. Generatrix Gpi of dens with IIpi, IIIpi, and IVpi lacking; Vpe also lacking.

Small abd. — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 18 setae. An. app. spine-like, rather long and curved in sagittal plane. Ratio an. app. : mucro = 0.8.

Fasciosminthurus longisetus n. sp. (Figs 7-20; Table III)

Material

Type material. — SPAIN, prov. Zaragoza, between Caspe and Candasnos, Refugio Cruz de San Vincente, alt. 300-400 m; very dry calcareous plateau with some scattered *Pinus halepensis*, and with *Rosmarinus officinalis*, *Stæhelina dubia*, *Pistacia lentiscus*, *Thymus vulgaris*, *Brachypodium ramosum*, *Phillyrea angustifolia*, *Quercus coccifera*, *Globularia alypum*, *Leuzea conifera*, etc.; collected with a net on unselected plants (SA25). 21-VI-1990. Syntypes: 428 specimens; 13 juv. and 11 ad. mounted.

Deposit of material. — MHNG: 50 specimens of the type material in alcohol. — MNHN: 50 specimens of the type material in alcohol. — ZMA: 50 specimens of the type material in alcohol. — LEITT: the rest of the material.

Description

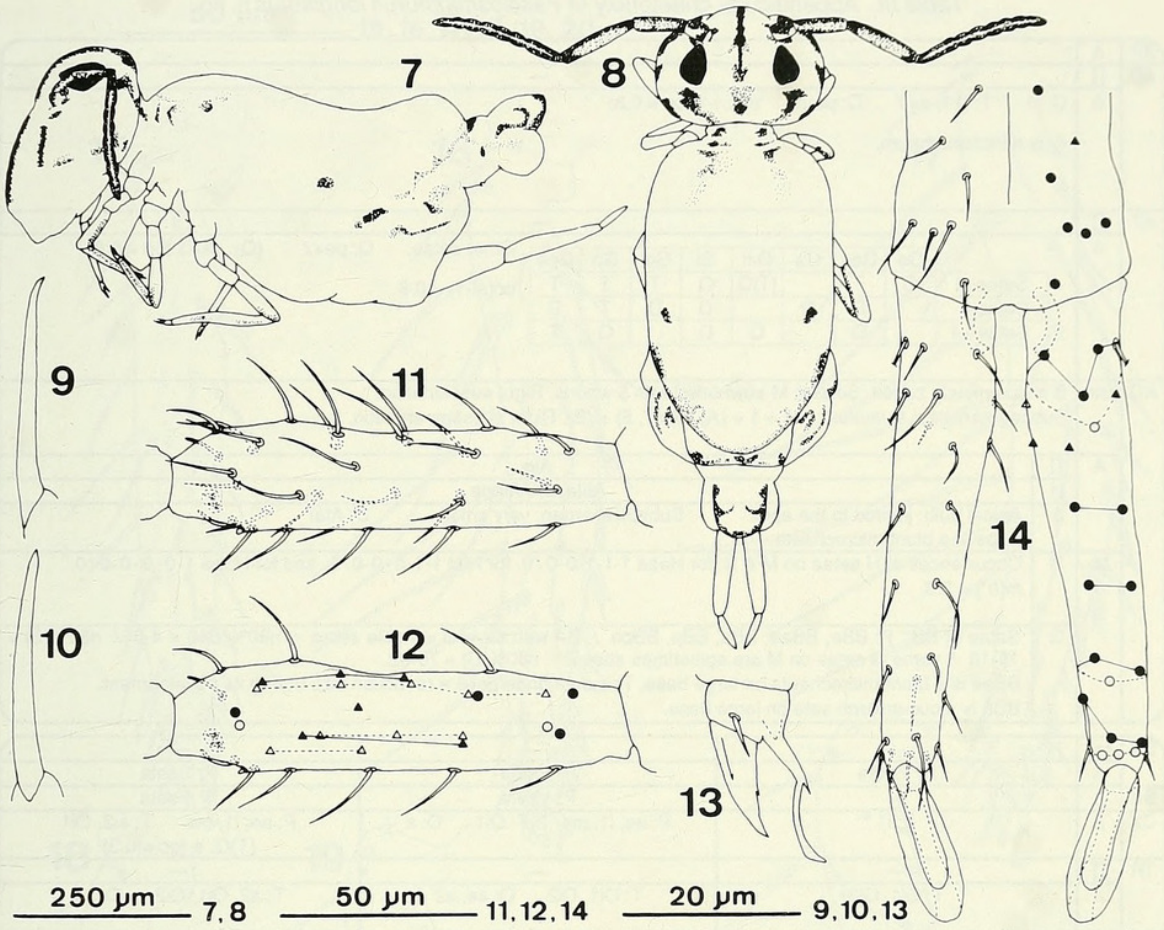
Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.55 - 0.65 mm; ♀: 0.6 - 0.85 mm.

Color (figs 7-8). — Background yellowish white with black or very dark brown spots. Postero-lateral area of great abd. with some elongated flecks. Small abd. with a transversal median fleck and two lateral spots on abd. V. Upper anal flap with a pair of lateral stripes joining behind each other, and in their half making each a pointed forward hook-shaped patch. Head with three longitudinal stripes: one being median, the other two broken by eyes. Direction of lateral stripes changes below eyes in an exterior curving. The median stripe reaches labrum, and above eyes broadens and lightens with brown-ochre. Three first antennal segments black flecked, the fourth dark brown. Eyepatches black. Some traces of pigment on legs. Furcula unpigmented. Very often adults have their great abd. with white marks made up of uric crystals.

Great abd. — Rather long with the back concave. Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae (figs 11-12). — Antennal ratios: in ♀, ant. I : II : III : IV = 1 : 2.0 : 2.7 : 5.5 and ant. : ceph. diag. = 1.7 ; in ♂, ant. I : II : III : IV = 1 : 2.0 : 2.7 : 5.9 and ant. :



FIGS 7-14

Fasciosminthurus longisetus n. sp. ad.; 7-8: habitus ♀; 9: an. app., lateral view; 10: an. app., frontal view; 11: ant. III, anterior view; 12: schematic representation of fig. 11, same legend as in fig. 6; 13: forepraetarsus, anterior view; 14: furcula, posterior view, on the right schematic representation as follows: setae of Ge and Gi drawn, a full symbol for a seta on reader's side (thus on posterior side), an empty symbol for a seta on opposite of reader's side, a ring for a primary seta, a triangle for a secondary seta. On the dens, for the whorls I to IV and B, the setae belonging to a same whorl are linked together by a line which is continuous on the posterior side and discontinuous on the other side.

ceph. diag. = 1.8. Chaetotaxic variables: for *G*: m = 79.5 / min = 78 / max = 83 ; m(*ISh**) = 0.33 ; m(*RSh*) = 0.30.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. No ov. org. behind the head. Labral formula: 6/5-5-4.

Legs (figs 13 & 15-20). — Femur: cup present. Special curved shape of meso and hindtibiotarsi. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 7, 8, 9. Setae on outer side of meso and hindtibiotarsi undergo an increasing heterochaetosis occurring in 1st molt. Claw with a small tooth on its inner crest. Empodial filament thick, curved on one direction, overhanging the claw, and with a subterminal thickening.

Table III. Appendicular chaetotaxy of *Fasciosminthurus longisetus* n. sp.

AP	Δ	—
AD	∏	—
	Δ	D: i0 T: i+1, e+1 Q: pe+1 (Q): i-1 (oc = 0.8) Ai is a trichobothrium.
AT	∏	—
	Δ	Other setae: Q: pe+2 (Q): pe+3 (oc = 0.6) oc(ai-1) = 0.8

	Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Setae -1	Q	T		(T)Q	Q	T	T	T
Setae 0		D	D		D	D	T	D
Setae +1		Q		Q	Q		Q	T

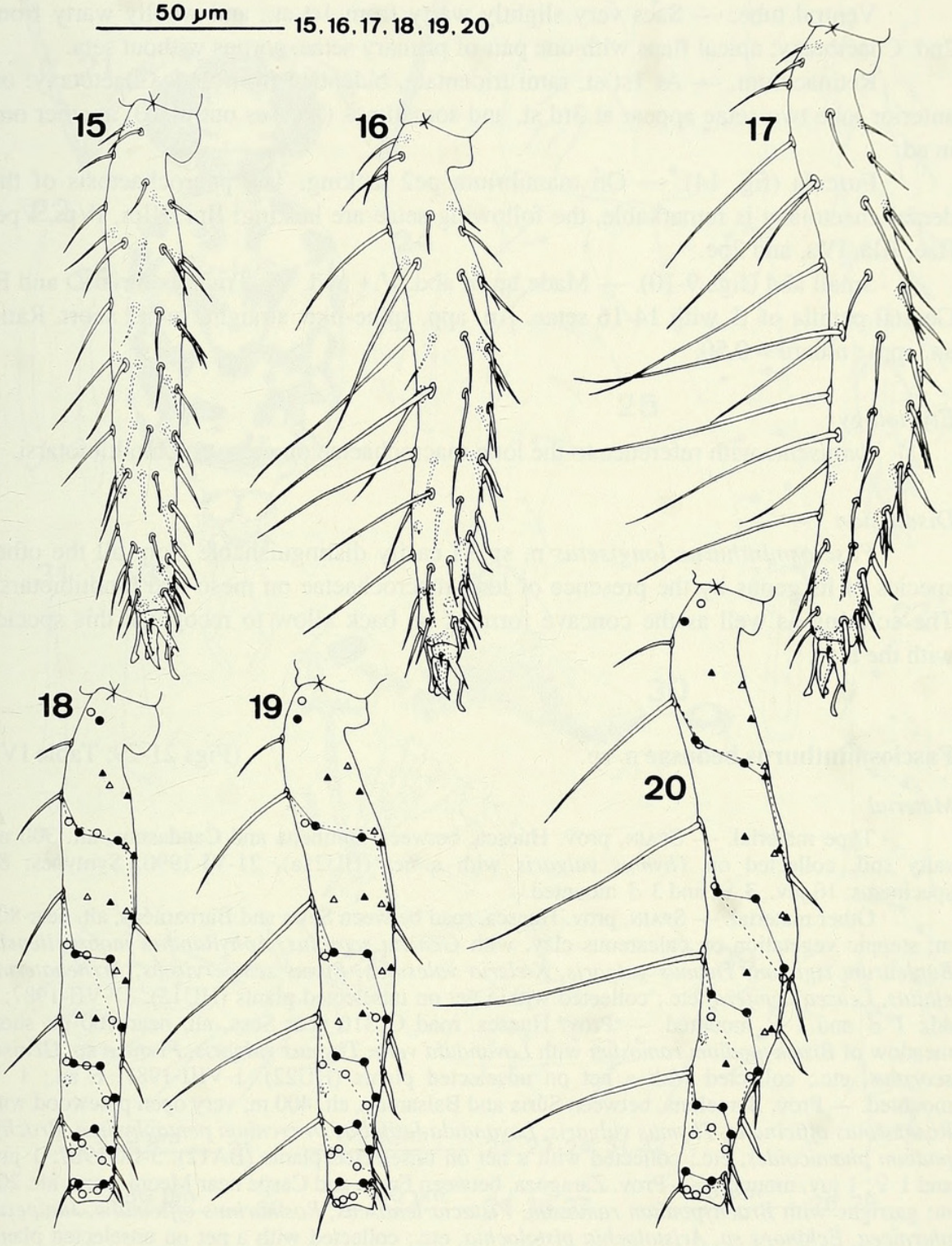
AQ	str	B is completely zoned. Section M euwhorled with 5 whorls. Right euwhorlation. Subsegmentation formula: 1 + 5 + 1 = (A) + (M1, 5) + (B). Right subsegmentation.
	A ∏	Alp
	A H	AIIleae, AIIlppe
	A Δ	Apical bulb: jointed to the apex Subapical organ: very small D: Alai AIIpe is a blunt microchaeta
	M & B H	Occurrences of H setae on M & B: for Heae 1-1-1-0-0/0, for Hipi 1-1-0-0-0/0, and for Hppe 1-0-0-0-0/0. m(*h**) = 2.0.
	M & B G	Setae of BB: P: BBe, BBae, BBa, BBp, BBpe / BA with several variable setae / n80%(*BM*) = 4-6 / n80%(*B*) = 15-18 / some G setae on M are sometimes absent / n80%(*G*) = 78-82. BBae is a blunt microchaeta on large base. This seta undergoes a reduction size during its development. BBa is a cucumiform seta on large base.

SB	prc	—	—	—
	Δ	P: 1 seta	P: 1 seta	P: 1 seta
SA	Δ	—	P: 1 seta	P: 1 seta
CX	Δ	P: i1	P: ae, i1, ms T: Oi1 Q: a	P: ae, i1, ms T: ai2, Oi1 (T)Q: a (oc = 0.3)
TR	∏	—	—	—
	Δ	T: Oi1, Oi2	T: Oi1, Oi2 Q: ae, a2	T: a2, Oi1, Oi2 Q: ae
FE	∏	—	—	pe1
	Δ	delayed primordial seta: Q: ae3 T: pe2, Op Q: pe4 (Q): ai2 (oc = 0.6)	T: a5, pe2, Op Q: ai2, pe4	T: a5, ai2, pe2 Q: ai4, pe4, Oi (Q): ai3 (oc = 0.6)
TI	V	Ia	Ia, IVp, Vp	Ia, IIIp, IVp, Vp
	K	—	—	—
	FP	+	+	+
	Δ	T: 4ai1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, 4pi2, FSai, FSpi, O2pe Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVpi are obliquely truncated setae.	T: 4ai1, 4i1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, 4pi2, FSai, FSpi, O2pe Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVi, IVpi are obliquely truncated setae. IIe, IIIe, IVe, Ve, IIIae, IVae, Vae of male and IIIe, IVe, IVae, Vae of female are macrochaetae.	T: 3ai, 3i, 4ai1, 4i1, Vai, Vpi, FSa Q: 2a, 3a, 3pi, 4a1, 4pi1, 4ai2, 4pi2, FSai, FSpi, O2pe Ip and Ipe are spatulate setae. Iai, Ipi, IIai, IIpi, IIIai, IIIi, IIIpi, IVai, IVi are obliquely truncated setae. IIe, IIIe, IVe, Ve, IIIae, IVae, Vae of male and IIe, IIIe, IVe, IIIae, IVae, Vae of female are macrochaetae.

MA	∏	—
	Δ	Q: pe3
DE	Δ	Other setae: — oc(Vp) = 0.7 oc(Be) = 0.7

		Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Whorls I to VI	I	P	P	P	P	P	P	P	P
	II			P				P	P
	III							P	P
	IV							P	P
	V						T	(T)Q	
	VI						Q		Q
Whorl B		(Q)		P			P	P	P

MU	Δ	Chaetotaxy: — Morphology: anterior lamella double, outer and inner lamellae smooth.



FIGS 15-20

Fasciosminthurus longisetus n. sp. ad. ♂; 15: praetarsus and tibiotarsus of foreleg, anterior view; 16: praetarsus and tibiotarsus of mesoleg, anterior view; 17: praetarsus and tibiotarsus of hindleg, anterior view; 18: schematic representation of fig. 15, same legend as in fig. 2; 19: schematic representation of fig. 16, same legend as in fig. 2; 20: schematic representation of fig. 17, same legend as in fig. 2.

Ventral tube. — Sacs very slightly warty from 1st st., and wholly warty from 2nd. Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and sometimes (2 cases out of 10) another one in ad.

Furcula (fig. 14). — On manubrium pe2 lacking. The paurochaetosis of the dental chaetotaxy is remarkable, the following setae are lacking: IIpi, IIIpi, IVpi, Vpe, IIae, IIIa, IVa, and 2pe.

Small abd (figs 9-10). — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 14-16 setae. An. app. spine-like, straight, rather short. Ratio an. app. : mucro = 0.50.

Etymology

longisetus with reference to the long macrochaetae on meso and hindtibiotarsi.

Discussion

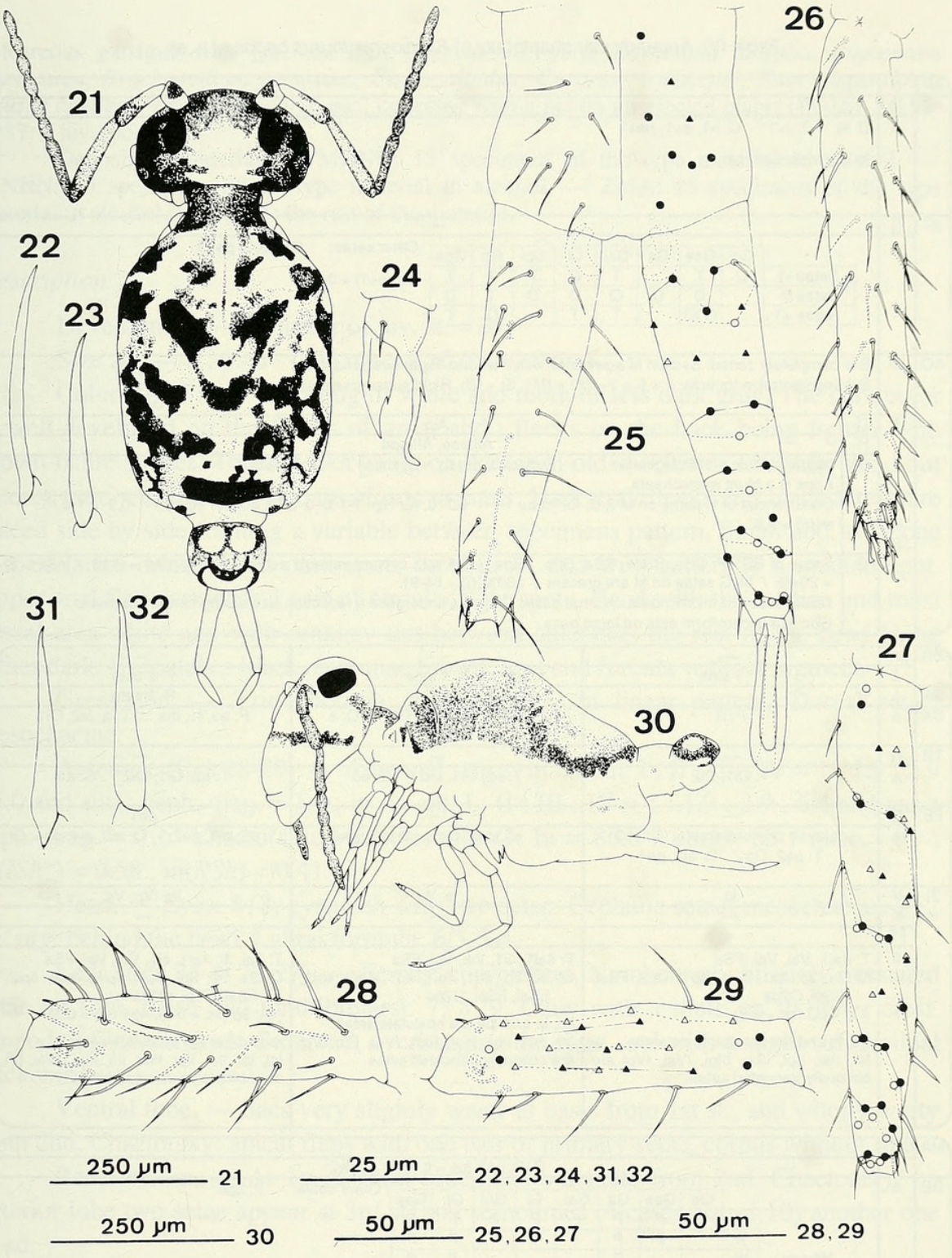
Fasciosminthurus longisetus n. sp. is easily distinguishable from all the other species of its genus by the presence of long macrochaetae on meso and hindtibiotarsi. The coloring as well as the concave form of its back allow to recognize this species with the lens.

Fasciosminthurus bedosae n. sp. (Figs 21-29; Table IV)

Material

Type material. — SPAIN, prov. Huesca, between Ontiñena and Candasnos, alt. 300 m; salty soil, collected on *Thymus vulgaris* with a net (HU21a). 21-VI-1990. Syntypes: 86 specimens; 10 juv., 3 ♀, and 3 ♂ mounted.

Other material. — SPAIN, prov. Huesca, road between Seira and Barbaruéns, alt. near 800 m; steppic vegetation on calcareous clay, with *Genista scorpius*, *Aphyllanthes monspeliensis*, *Bupleurum rigidum*, *Thymus vulgaris*, *Kœleria valesiaca*, *Buxus sempervirens*, *Arrhenaterum elatius*, *Leuzea conifera*, etc.; collected with a net on unselected plants (HU15). 31-VII-1987: 3 ad.; 1 ♂ and 1 ♀ mounted. — Prov. Huesca, road C1310 near Sesa, alt. near 400 m; short meadow of *Brachypodium ramosum* with *Lavandula vera*, *Thymus vulgaris*, *Festuca* sp, *Genista scorpius*, etc.; collected with a net on unselected plants (HU22). 1-VIII-1987: 6 ad.; 1 ♀ mounted. — Prov. Barcelona, between Súria and Balsareny, alt. 400 m; very open pinewood with *Rosmarinus officinalis*, *Thymus vulgaris*, *Lavandula latifolia*, *Dorycnium pentaphyllum*, *Brachypodium phœnicoides*, etc.; collected with a net on unselected plants (BA12). 3-IX-1987: 1 juv. and 1 ♀; 1 juv. mounted. — Prov. Zaragoza, between Fraga and Caspe near Mequinenza, alt. 200 m; garrigue with *Brachypodium ramosum*, *Pistacia lentiscus*, *Rosmarinus officinalis*, *Juniperus phœnicea*, *Echinops sp*, *Aristolochia pistolochia*, etc.; collected with a net on unselected plants (SA1). 15-VI-1987: 1 juv. mounted. 20-VI-1990: 15 juv. — Prov. Zaragoza, between Zuera and Las Pedrosas, near Zuera, alt. near 300 m; calcareous garrigue with *Brachypodium ramosum*, *Dorycnium pentaphyllum*, *Thymus vulgaris*, *Quercus coccifera*, *Pinus halepensis*, *Juniperus oxycedrus*, etc.; collected with a net on unselected plants (SA5). 15-VI-1987: 5 ad.; 1 ♂ and 1 ♀ mounted. — Prov. Zaragoza, between Erla and Valpalmas, near Erla, alt. near 450 m; calcareous garrigue with *Brachypodium ramosum*, *Rosmarinus officinalis*, *Thymus vulgaris*, *Genista scorpius*, *Buxus sempervirens*, etc.; collected with a net on unselected plants (SA6). 15-VI-1987: 1 juv. mounted. — FRANCE, dép. Pyrénées Orientales, near Pézilla-de-Conflent, alt. 350 m;



FIGS 21-32

Figs 21-29: *Fasciosminthurus bedosae* n. sp. ad.; 21: habitus ♀; 22: an. app., lateral view; 23: an. app., frontal view; 24: mesopraetarsus, anterior view; 25: furcula, posterior view, schematic representation with the same legend as in fig. 14; 26: praetarsus and tibiotarsus of mesoleg, anterior view; 27: schematic representation of fig. 26, same legend as in fig. 2; 28: ant. III, anterior view; 29: schematic representation of fig. 28, same legend as in fig. 6.

Figs 30-32: *Fasciosminthurus cassagnaui* n. sp. ad.; 30: habitus ♀; 31: an. app., lateral view; 32: an. app., frontal view.

Table IV. Appendicular chaetotaxy of *Fasciosminthurus bedosae* n. sp.

AP Δ —

AD Π —

Δ D: i0 T: i+1 Q: i-1, e+1, pe+1

Ai is a trichobothrium.

AT Π —

Δ

	Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Setae -1	Q	T		T	Q	T	T	T
Setae 0		D	D	Q	D	D	T	D
Setae +1		(T)Q		T	T		Q	T

Other setae: Q: pe+2, pe+3

oc(ae+1) = 0.6

AQ str B is completely zoned. Section M euwhorled with 5 whorls. Right euwhorlation.
Subsegmentation formula: 1 + 5 + 1 = (A) + (M1, 5) + (B). Right subsegmentation.

A Π Alp

H Allleae, Alllppe

Δ Apical bulb: in part invaginated Subapical organ: very small D: Alai
Allpe is a blunt microchaeta

M & B H Occurrences of H setae on M & B: for Heae 1-1-1-1-0 / 0, for Hipi 1-1-0-0-0 / 0, and for Hppe 1-1-0.9-0.1-0 / 0.
m(*h*") = 3.5.

G Setae of BB: P: BBe, BBae, BBa, BBp, BBpe / BA with several variable setae / n80%(*BM*) = 8-13 / n80%(*B*) = 20-25 / all G setae on M are present / n80%(*G*) = 84-91.
BBae is a blunt microchaeta on large base. This seta undergoes a reduction size during its development.
BBa is a cucumiform seta on large base.

SB	prc	—	—	—
	Δ	P: 1 seta	P: 1 seta	P: 1 seta
SA	Δ	—	P: 1 seta	P: 1 seta
CX	Δ	P: i1	P: ae, i1, ms T: Oi1 Q: a	P: ae, i1, ms T: a, ai2, Oi1
TR	Π	—	—	—
	Δ	T: Oi1, Oi2	T: a2, Oi1, Oi2 Q: ae	T: a2, Oi1, Oi2 Q: ae
FE	Π	—	—	pe1
	Δ	delayed primordial seta: Q: ae3 T: pe2, Op Q: ai2, pe4	T: a5, pe2, Op Q: ai2, pe4	T: a5, ai2, pe2 Q: ai3, ai4, pe4, Oi
TI	V	Ia	Ia, Vp	Ia, IVp, Vp
	K	—	—	—
	FP	+	+	+
	Δ	T: 4ai1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, FSai, FSpi, O2pe (Q): 4pi2 (oc = 0.8) Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVpi are obliquely truncated setae.	T: 4ai1, 4i1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, 4pi2, FSai, FSpi, O2pe Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVi, IVpi are obliquely truncated setae.	T: 3ai, 3i, 4ai1, 4i1, Vai, Vpi, FSa Q: 2a, 3a, 3pi, 4a1, 4pi1, 4ai2, 4pi2, FSai, FSpi, O2pe (Q): 3p (oc = 0.6), 4p1 (oc = 0.5) Ip and Ipe are spatulate setae. Iai, Ipi, IIai, IIpi, IIIai, IIIi, IIIpi, IVai, IVi are obliquely truncated setae.

MA Π —

Δ (T)Q: pe3 (oc = 0.7) Q: pe2

DE Δ

		Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Whorls I to VI	I	P	P	P	P	P	P	P	P
	II		P	P				P	P
	III			P				P	P
	IV			P				P	P
	V						T	T	Q
	VI						Q		T
Whorl B		T		P			P	P	P

Other setae: P: 2pe

MU Δ Chaetotaxy: — Morphology: anterior lamella double, outer and inner lamellae smooth.

calcareous garrigue with *Quercus ilex*, *Quercus coccifera*, *Lavandula latifolia*, *Bupleurum fruticosum*, *Brachypodium ramosum*, *Cistus albidus*, *Cneorum tricoccum*, *Ruta angustifolia*, *Leuzea conifera*; *Thymus vulgaris*, etc.; collected with a net on unselected plants (PO16). 24-VI-1987: 1 juv. mounted.

Deposit of material. — MHNG: 15 specimens of the type material in alcohol. — MNHN: 15 specimens of the type material in alcohol. — ZMA: 15 specimens of the type material in alcohol. — LEITT: the rest of the material.

Description

Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.45 - 0.55 mm; ♀: 0.55 - 0.8 mm.

Color (fig. 21). — Merging of white and more or less dark gray. The dark color is well-developed on the flanks of great abd.; flecks on the back being lighter with brown-ochre shades. These flecks going on darker in old specimens and they stand out against pure white spots made up of uric crystals. Dark gray flecks and black flecks are placed side by side forming a variable between specimens pattern. Small abd. with one pair of latero-dorsal small dark spots on abd. V, and with generally a median spot. Upper anal flap dark with a pair of circular light spots. Head with the median and most dorsal area white and with orangey tint between antennae, the rest of the head being rather dark. Eyepatches black, antennae brown, legs and furcula without pigment.

Great abd. — Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae (figs 28-29). — Antennal ratios: in ♀, ant. I : II : III : IV = 1 : 1.9 : 2.9 : 6.0 and ant. : ceph. diag. = 1.6 ; in ♂, ant. I : II : III : IV = 1 : 1.9 : 2.9 : 6.4 and ant. : ceph. diag. = 1.6. Chaetotaxic variables: for *G*: m = 86.8 / min = 83 / max = 91 ; m(*ISh**) = 0.58 ; m(*RSh*) = 0.41.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. 2+2 ov. org. behind the head. Labral formula: 6/5-5-4.

Legs (figs 24 & 26-27). — Femur: cup present. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 7, 8, 9. Claw with a tooth on its inner crest. Empodial filament thick, S-curved, overhanging the claw, and with a slight subterminal thickening.

Ventral tube. — Sacs very slightly warty at basis from 1st st., and wholly warty from 2nd. Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and sometimes (4 cases out of 10) another one in ad.

Furcula (fig. 25). — Generatrix Gpi on dens with IIpi, IIIpi and IVpi lacking.

Small abd (figs 22-23). — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 18 setae. An. app. spine-like, straight. Ratio an. app. : mucro = 0.54.

Etymology

This species is dedicated to Dr. A. Bedos.

Discussion

Into the *Fasciosminthurus* genus, the seta (DE)IIpi is always lacking in the following species* : *sauteri* (Nayrolles & Lienhard, 1990), *raynalae* (Nayrolles, 1987), *virgulatus* (Skorikow, 1899), *albanicus* (Stach, 1956), *pontignanoi* Bretfeld, 1992, stat. Nayrolles, 1993, *longisetus* n. sp., *bedosae* n. sp., and *cassagnaui* n. sp. Among these species, only *bedosae* has 2+2 ov. org. behind the head (considerations based on BRETFELD's observations (1990, 1992), on observations included in the present paper, and on unpublished data for *sauteri*). The coloring also allows to distinguish this species.

Fasciosminthurus cassagnaui n. sp. (Figs 30-32; Table V)

Material

Type material. — SPAIN, prov. Lérida, between Coll de Nargó and Collado de Bóixols, alt. 900 m; calcareous garrigue with many *Aphyllanthes monspeliensis* and *Thymus vulgaris*, and few *Lavandula latifolia*; collected with a net on unselected plants (LE24). 19-VI-1990. Syntypes: 3 juv. and 10 ad.; 3 juv., 1 ♂, and 1 ♀ mounted.

Other material. — Same station. 30-V-1990: 2 juv., 2 ♂, and 4 ♀; all the ad. and 1 juv. mounted. — Prov. Barcelona, between Tona and Puerto de la Pollosa, alt. 750 m; scattered vegetation on calcareous clay, with *Thymus vulgaris*, *Festuca sp*, *Lavandula latifolia*, *Linum salsoloides*, *Aphyllanthes monspeliensis*, etc.; collected with a net on unselected plants (BA5). 25-VI-1987: 1 juv. and 5 ad.; 1 juv., 1 ♂, and 1 ♀ mounted. — Prov. Tarragona, between Vilalba dels Arcs and La Fatarella, alt. 500 m; steppic vegetation with *Bromus madritensis* and *Brachypodium ramosum*; collected with a net on unselected plants (TA7a). 2-IX-1987: 3 ad.; 1 ♂ mounted. 20-VI-1990: 4 ♀, 1 mounted. — Prov. Tarragona, between El Pla de Santa Maria and El Pont d'Armentera, alt. near 400 m; scattered very short grass grazed by sheep; collected with a net on unselected plants (TA14). 20-VI-1990: 1 juv., 1 ♂, and 1 ♀; 1 juv. mounted. — FRANCE, dep. Var, district Le Cannet-des-Maures, track between La Grande Pièce and La Basse Verrerie, alt. 70 m; short garrigue, steppic vegetation with some maritime pines and holm oaks, graminae and *Lavandula stœchas*, *Cistus salviæfolius*, *Cistus monspeliensis*, etc.; collected with a net on unselected plants (VA5). 13-VI-1992: 127 specimens; 1 juv. mounted.

Deposit of material. — MHNG: station VA5, 13-VI-1992, 20 specimens in alcohol. — MNHN: station VA5, 13-VI-1992, 20 specimens in alcohol. — ZMA: station VA5, 13-VI-1992, 20 specimens in alcohol. — LEITT: the rest of the material.

Description

Development. — Number of juv. st. = 3.

Size ad. — ♂: 0.5 mm; ♀: 0.5 - 0.6 mm.

Color (fig. 30). — Great abd. with two juxtaposed contrasted colors: white or yellow on ventral side, and gray – more or less dark and more or less tinged with

* This character is the 11th in BRETFELD's list (1992, p. 27), it is noted "Dens row J". In BRETFELD's system (see BRETFELD 1990) "2..1" means that BRETFELD's row J bears two basal setae and, aside from the distal whorl, only one apical seta, this apical seta, J1 in BRETFELD's system, being my Ipi seta (see NAYROLLES 1990). Remark that Bretfeld's seta J0 is included in the apical whorl (setae of this whorl being numbered 0 by BRETFELD) and corresponds to my seta Ii. "2..2" means that BRETFELD's row J bears two basal and, aside from the distal whorl, two apical setae, the second apical seta, J2 for BRETFELD, being my IIpi seta. Thus, the state written "2..1" by BRETFELD corresponds to the absence of IIpi, and *virgulatus*, *albanicus* and *pontignanoi* have the "2..1" state in BRETFELD's list.

Table V. Appendicular chaetotaxy of *Fasciosminthurus cassagnaui* n. sp.

AP Δ —

AD Π —

AD Δ D: i0 T: i+1 (T)Q: e+1 (oc = 0.3) Q: i-1, pe+1

Ai is a trichobothrium.

AT Π —

AT Δ

	Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Setae -1	Q	T		T	Q	(T)Q	T	T
Setae 0		D	D	Q	D	D	T	D
Setae +1		Q		T	(T)Q		Q	T

Other setae: Q: pe+2, pe+3

oc(pi-1) = 0.8 oc(i+1) = 0.5

AQ str B is completely zoned. Section M euwhorled with 5 whorls. Right euwhorlation.
Subsegmentation formula: 1 + 5 + 1 = (A) + (M1, 5) + (B). Right subsegmentation.

A Π Alp

A H AIIleae, AIIIppe

A Δ Apical bulb: in part invaginated Subapical organ: very small D: Alai
AIIpe is a blunt microchaeta

M & B H Occurrences of H setae on M & B: for Heae 1-1-1-1-0 / 0, for Hipi 1-1-0-0-0 / 0, and for Hppe 1-1-0.3-0-0 / 0.
m(*h**) = 3.2.

M & B G Setae of BB: P: BBe, BBae, BBa, BBp, BBpe / BA with several variable setae / n80%(*BM*) = 8-11 / n80%(*B*) = 19-23 / all G setae on M are present / n80%(*G*) = 83-88.
BBae is a blunt microchaeta on large base. This seta undergoes a reduction size during its development.
BBa is a cucumiform seta on large base.

SB	prc	—	—	—
	Δ	P: 1 seta	P: 1 seta	P: 1 seta
SA	Δ	—	P: 1 seta	P: 1 seta
CX	Δ	P: i1	P: ae, i1, ms T: Oi1 Q: a	P: ae, i1, ms T: ai2, Oi1 (T)Q: a (oc = 0.8)
TR	Π	—	—	—
	Δ	T: Oi1, Oi2	T: a2, Oi1, Oi2 Q: ae	T: a2, Oi1, Oi2 Q: ae
FE	Π	—	—	pe1
	Δ	delayed primordial seta: Q: ae3 T: pe2, Op Q: ai2, pe4	T: a5, pe2, Op Q: ai2, pe4	T: a5, ai2, pe2 Q: ai3, pe4, Oi (Q): ai4 (oc = 0.8)
TI	V	Ia	Ia, Vp	Ia, IVp, Vp
	K	—	—	—
	FP	+	+	+
	Δ	T: 4ai1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, FSai, FSpi, O2pe (Q): 4pi2 (oc = 0.5) Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVpi are obliquely truncated setae.	T: 4ai1, 4i1, Vai, Vpi, FSa Q: 3a, 3p, 4a1, 4pi1, 4p1, 4ai2, FSai, FSpi, O2pe (Q): 4pi2 (oc = 0.6) Ipi, Ip and Ipe are spatulate setae. Iai, IIai, IIpi, IIIai, IIIpi, IVai, IVi, IVpi are obliquely truncated setae.	T: 3ai, 3i, 4ai1, 4i1, Vai, Vpi, FSa Q: 2a, 3a, 3p, 4a1, 4pi1, 4ai2, FSai, FSpi, O2pe (Q): 3pi (oc = 0.8), 4pi2 (oc = 0.8), 4p1 (oc = 0.2) Ip and Ipe are spatulate setae. Iai, Ipi, IIai, IIpi, IIIai, IIIi, IIIpi, IVai, IVi are obliquely truncated setae.

MA Π —

MA Δ (T)Q: pe3 (oc = 0.5) (Q): pe2 (oc = 0.6)

DE Δ

		Ge	Gae	Ga	Gai	Gi	Gpi	Gp	Gpe
Whorls I to VI	I	P	P	P	P	P	P	P	P
	II		P	P				P	P
	III			P				P	P
	IV			P				P	P
	V						(T)Q	T	(Q)
	VI						Q		(T)Q
Whorl B		T		P			P	P	P

Other setae: P: 2pe

oc(Vpi) = 0.5 oc(Vpe) = 0.5 oc(Vlpe) = 0.5

MU Δ Chaetotaxy: — Morphology: anterior lamella double, outer and inner lamellae smooth.

yellow – on dorsal side. Two small spots, in very lateral position, on furcular segment. Small abd. with often a pair of latero-dorsal spots on abd. V. Upper anal flap showing a gray background with three light spots: two at basis with circular shape and marked outline, and one less well delimited at apex. Head light with a transversal gray stripe under antennae, a pair of gray spots behind eyes, and orangey ochre between antennae. Eyepatches black, antennae gray-brown, legs and furcula white.

Great abd. — Trichobothria: A, B, and C in linear pattern. Dorsal setae: mesochaetae.

Antennae. — Antennal ratios near the same in both sexes, ant. I : II : III : IV = 1: 2.0 : 2.9 : 6.5 and ant. : ceph. diag. = 1.6. Chaetotaxic variables: for *G*: m = 84.8 / min = 82 / max = 89 ; m(*ISh**) = 0.53 ; m(*RSh*) = 0.39.

Head. — Eyes: 8+8; eyepatch with two setae. Cephalic setae: mesochaetae. No ov. org. behind the head. Labral formula: 6/5-5-4.

Legs. — Femur: cup present. Numbers of obliquely truncated setae on fore, meso and hindtibiotarsi: 7, 8, 9. Claw with a tooth on its inner crest. Empodial filament thick, S-curved, overhanging the claw, and with a slight subterminal thickening.

Ventral tube. — Sacs smooth at 1st st. and warty from 2nd. Chaetotaxy: apical flaps with one pair of primary setae, corpus without seta.

Retinaculum. — At 1st st. rami tridentate, bidentate from 2nd. Chaetotaxy: on anterior lobe two setae appear at 3rd st. and another one in ad.

Furcula. — Generatrix Gpi on dens with IIpi, IIIpi and IVpi lacking.

Small abd (figs 31-32). — Made up of abd. V + abd. VI. Trichobothria: D and E. Genital papilla of ♂ with 16-18 setae. An. app. spine-like, straight, sharply thickened at basis. Ratio an. app. : mucro = 0.61.

Etymology

This species is dedicated to Pr. P. Cassagnau.

Discussion

Among the species of *Fasciosminthurus*, two show a thickened an. app., they are: *F. cassagnaui* n. sp. and, from BRETFELD 's redescription (1992), *F. circumfasciatus* (Stach, 1956). Coloring as well as two other criteria allow to separate these species: *circumfasciatus* has 2+2 ov. org. behind the head and (DE)IIpi present, whereas *cassagnaui* has no ov. org. behind the head nor the seta (DE)IIpi.

RÉSUMÉ

Nous complétons la description des espèces de *Fasciosminthurus* suivantes: *F. cugnyi* (Nayrolles, 1987), *F. quinquefasciatus* (Krausbauer, 1902) et *F. raynalae* (Nayrolles, 1987). Trois nouvelles espèces sont décrites: *F. bedosae* n. sp., *F. cassagnaui* n. sp. et *F. longisetus* n. sp.

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