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NOTES ON THE HYPOPI OF THE GENUS *CHAETODACTYLUS* RONDANI, 1866 (ACARI, CHAETODACTYLIDAE)

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(Avec 3 figures dans le texte)

ABSTRACT

The hypopi of 4 species of genus *Chaetodactylus* RONDANI, 1866 are redescribed and depicted : *Ch. ceratinae* FAIN, 1974, *Ch. leleupi* FAIN, 1974, *Ch. decellei* FAIN, 1974 and *Ch. dalyi* FAIN, 1974. Three new subgenera are created in the genus *Chaetodactylus* (*Achaetodactylus*, *Ochaetodactylus* and *Spinodactylus*) and a key to the species is given.

In the present paper we complete the description of 4 species of *Chaetodactylus* from their hypopial stage and we provide the first figures of them. Three new subgenera are created in the genus and a key to the known species is given.

DIVISION OF GENUS *CHAETODACTYLUS*

The following subgenera are created in the genus *Chaetodactylus*, from their hypopial stage :

1. *Chaetodactylus* RONDANI, 1866 : Tarsus IV bearing 3 long setae (one very long and 2 much shorter) and 2 very short setae. Palposoma consisting in 2 short cylindrical cuticular lobes each bearing a solenidion *alpha*. Dorsum with either all well-developed setae or with setae unequal in length some very short and thin, others longer and strong. Epimerite IV absent. Ventroapical seta of tarsi I-III thin. Solenidion ω 2 present.

Type species. — *Trichodactylus osmiae* DUJARDIN, 1839 (hypopus). Other species : *Ch. reaumuri* (OUDEMANS, 1905); *Ch. anthidii* (OUDEMANS, 1911); *Ch. birulai* ZACHVATKIN, 1941; *Ch. poetae* SAMSINAK, 1973; *Ch. dalyi* FAIN, 1974. The species *Ch. ludwigi* (TROUESSART, 1904) unadequately described is tentatively placed here.

2. *Achaetodactylus* subgen. nov. : Tarsus IV bearing 1 very long apical seta and 2 microsetae. Palposoma and solenidia *alpha* lacking. All the dorsal setae are very thin and very short. Epimerite IV long. Ventroapical seta of tarsi I-III thin. Solenidion ω 2 present.

Type species. — *Chaetodactylus leleupi* FAIN, 1974. Other species : *Ch. ceratinae* FAIN, 1974. The species *Ch. dementjevi* ZACHVATKIN, 1941, unsufficiently known, is provisionallly placed here.

3. *Ochaetodactylus* subgen. nov. : As subgenus *Achaetodactylus* but tarsus IV bearing 3 microsetae (2 apical and 1 ventral) instead of 2, the solenidion ω 2 is absent, the dorsum bears well-developed spine-like setae and the epimerite IV is short.

Type species. — *Chaetodactylus decellei* FAIN, 1974.

4. *Spinodactylus* subgen. nov. : Solenidion ω 2, palposoma and epimerites IV as in *Chaetodactylus*. Dorsum with mostly rather long spines. Ventroapical seta of tarsi I-III is a strong spine. Seta *cx I* is a short ovoid spine. Tarsus IV with 3 very long subequal setae and 2 short setae.

Type species. — *Chaetodactylus claviger* OUDEMANS, 1928. The second species *Ch. krombeini* BAKER, 1962, is probably a synonym of *Ch. claviger*.

Key to the genus *Chaetodactylus* (Hypopi)

(N. B. *Chaetodactylus ludwigi* (TROUESSART, 1904) and *Ch. dementjevi* ZACHVATKIN, 1941 unadequately described are not mentioned in this key.)

1. — Seta *cx I* are short and thick ovoid spines. Apicoventral seta of tarsi I-III is a thick spine. Tarsus IV with 3 very long subequal setae and 2 much shorter setae . Subgenus *Spinodactylus* subg. n. . . . . Type species : *Ch. (S.) claviger* OUDEMANS, 1928.
   Seta *cx I* and apicoventral seta of tarsi I-III thin. Tarsus IV with only one very long seta and 2 to 4 much shorter setae . . . 2.

2. — Palposoma and solenidion *alpha* lacking. Tarsus IV with 1 very long seta and 2 or 3 microsetae . . . . . 3.
   Palposoma formed of 2 cuticular cylindrical lobes each bearing a solenidion *alpha*. Tarsus IV with 3 long unequal and 2 much shorter setae . . Subgenus *Chaetodactylus* RONDANI, 1866 (5).

3. — All dorsal setae very short and very thin. Tarsus IV with 1 long apical seta and 2 microsetae. Solenidion ω 2 present. Epimerites IV long . . . . . Subgenus *Achaetodactylus* subg. nov. (4).

Most of dorsal setae are spinelike and well developed. Tarsus IV with 1 long apical seta and 3 microsetae. Solenidion ω 2 absent. Epimerites IV short . . . Subgenus *Ochaetodactylus* subg. nov. (One species : *Ch. (O.) decellei* FAIN, 1974).

4. — Genua I-II with 2 setae very thin and short. Posterior suckers rounded, 12 μ wide. Sternum bifid posteriorly. Propodonotal shield triangular anteriorly. Lateral conoids situated between anterior and posterior suckers. Setae *l 5* 32 μ long, 48 μ apart . . . . . *Ch. (A.) ceratinae* FAIN, 1974.

Genua I-II with 2 longer (20-30 μ), rodlike and barbed setae. Posterior suckers 21 μ wide with posterior border straight. Sternum not bifid posteriorly. Propodonotal shield rounded anteriorly. Lateral conoids larger and situated almost on the same line as anterior suckers. Setae *l 5* 40-45 μ long and 70 μ apart . . . . . *Ch. (A.) leleupi* FAIN, 1974.

5. — Tarsus IV with 1 apical strong and very long seta, 1 posteroapical seta 7 to 10 times as long as tarsus, 1 anteroapical 2,5 to 5 times as long as tarsus and 2 ventral setae slightly shorter than tarsus . 6.

Posteroapical seta of tarsus IV never longer than 3 times the length of tarsus and either equal to anteroapical seta or only a slightly longer or shorter . . . . . 8.

6. — Setae *d 3* much shorter and thinner than *d 1* and *d 2* . . . . . *Ch. (Ch.) birulai* ZACHVATKIN, 1941.

Setae *d 3* equal to *d 1* and *d 2* . . . . . 7.

7. — Setae *sc e* 2,5 times as long as *sc i*. Lateral conoids on the same level as the posterior suckers or very slightly behind the latter . . . . . *Ch. (Ch.) reaumuri* (OUDEMANS, 1905).

Setae *sc e* subequal to *sc i*. Lateral conoids distinctly behind the posterior suckers . . . . *Ch. (Ch.) poetae* SAMSINAK, 1973.

9. — Tarsus IV with a very long apical seta, a short (30 μ) anteroapical seta only slightly longer (42 μ) than the tarsus (25 μ), a very small posteroapical seta and 2 very unequal ventral setae (respectively 15 μ and 45 μ). The ventral seta of tarsus III is not apical but situated in the middle of tarsus. Lateral and paramedian conoids situated on a concave line. Dorsal setae are spines 15 μ to 45 μ long. Solenidion of tibia IV 18 μ long . *Ch. (Ch.) dalyi* FAIN, 1974.

The posteroapical seta of tarsus IV is at least as long as the tarsus; the ventral setae are equal or subequal. Other characters variable . . . . . 10.

10. — The 4 conoids are situated on a sligthly concave line. Anteroapical seta of tarsus IV longer (45 μ) than tarsus (35 μ) and than posteroapical seta (33 μ) . . *Ch. (Ch.) anthidii* (OUDEMANS, 1911).
Lateral conoids situated on the same line as posterior suckers. Anteroapical seta of tarsus IV slightly shorter (50-65 μ) than posteroapical seta (70-75 μ), tarsus 30 μ long. Posterior part of body with a thick concave sclerite (specimens from *Osmia rufa*) . . . . . *Ch. (Ch.) osmiae* (DUJARDIN, 1839).
(= ? *Ch. (Ch.) mahunkai* SAMSINAK, 1973).

1. Chaetodactylus (Achaetodactylus) ceratinae FAIN, 1976

Hypopus (Figs. 1, 2, 9). — Holotype 237 μ long and 171 μ wide. In 2 paratypes 255 × 180 μ and 260 × 178 μ. Dorsum : With 2 large longitudinally striated shields. Propodonotal shield bearing the *sc i*, *sc e* and *l 1* setae. Hysteronotal shield bearing laterally the *h*, *l 2* and *l 3* setae. All these setae are thin and very short (5 μ). Venter : Sternum long, forked posteriorly. Epimerites IV strongly developed, arriving close to the genital area where they are forked. Suctorial plate 86 μ wide with anterior suckers nearly as wide (13 μ) as posterior suckers (15 μ). Lateral conoids very anterior and in front of the posterior suckers. Ventral setae long and very thin. Setae *l 5* 48 μ apart. Legs : Tarsi I-III bearing 2 foliate setae and 3 (tarsi I-II) or 1 (tarsus III) simple setae; the ventroapical setae are thin. Tarsus IV as wide as long (7 μ) bearing a very long and strong apical seta and 2 microsetae. Genua I-II with 2 very short simple setae.

Host and locality. — 1) Holotype and 15 paratypes (all hypopi) from *Ceratina lativentris* ♀ (bee n° 171), Nairobi, Kenya, 3.VII. 1967. The mites were attached behind the wings; 65 paratypes from the same host and locality (bees n° 144, 145, 146, 147, 151, 153, 154, 155, 157, 163, 166, 167, 168, 169, 172) (11.V. to 17.VI.1967). Also from the same bee but in Ngurdoto National Park, Tanzania (bees n° 173A and B) and Mto Wa Mbu (bee n° 177) (on wing) (20 specimens).

2) From *Ceratina apaca* ♀, Salt Rock, Natal, South Africa (bees n° 239, 240, 241, 253) (25 specimens) (Coll. H. Daly). Holotype in Museum of Tervuren. Paratypes in Institut royal des Sciences naturelles de Belgique (I. R. S. N. B.).

2. Chaetodactylus (Achaetodactylus) leleupi FAIN, 1976

Hypopus (Figs. 3, 4, 10). — Holotype 272 μ long and 210 μ. In 2 paratypes 254 μ × 178 μ and 268 μ × 200 μ. Dorsum : As in *Ch. ceratinae* but the shields are larger thans in this species and their pattern of lines is less distinct than in the latter. Dorsal setae very thin and

shorter. Venter : Sternum long, not forked. Epimerites very long. Suctorial plate 95 μ wide. Diameter of anterior suckers 16 μ, of posterior suckers 21 μ. The posterior border of the posterior suckers is straight. Lateral conoids much larger than paramedian conoids and situated in front of posterior suckers. Ventral setae long and very thin. Setae *l 5* 72 μ apart. Legs : Genua I with a dorsal seta thick and barbed 30 μ and a thinner rodlike ventral barbed seta 22 μ long. In genua II the dorsal seta is a little smaller and the ventral sera stronger than in genua I. Tarsus IV as in *Ch. ceratinae.*

Host and locality. — Holotype from *Ceratina ruwenzorica* ♀ from Karen, Nairobi, Kenya, 11.V.1967 (bee n° 222). From the same host and locality but from other bees n° 181, 182, 183, 185, 187, 188, 193, 195, 200, 217, 218, 219, 220, 222 (40 paratypes). The mites were fixed

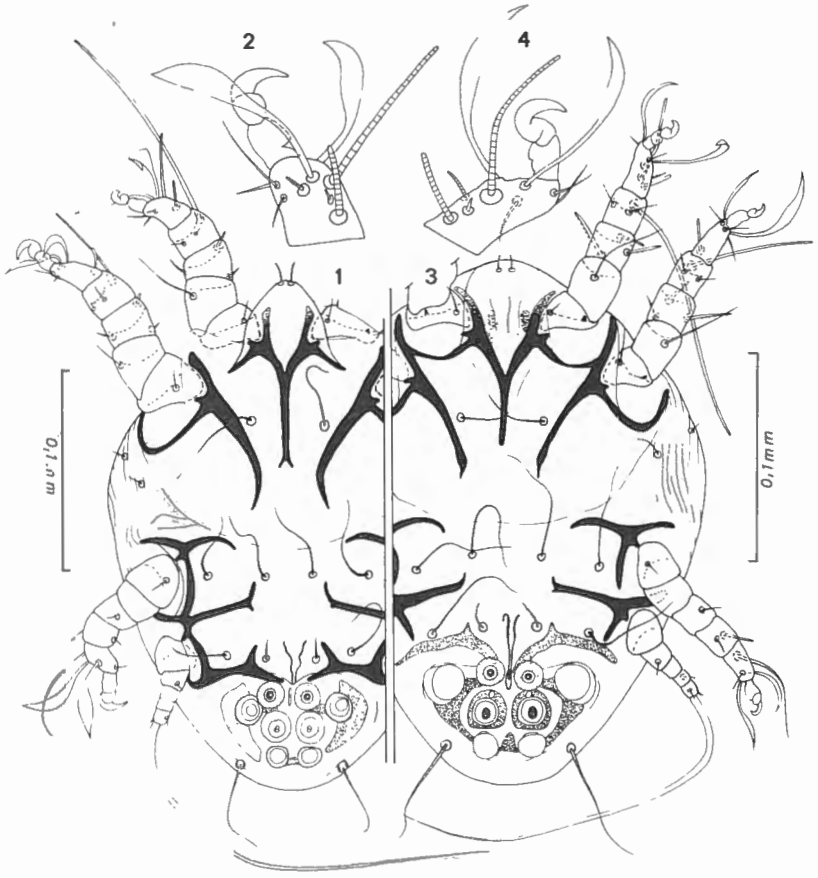

Fig. 1-4. — Fig. 1-2 : *Chaetodactylus* (*Achaetodactylus*) *ceratinae* FAIN. Hypopus : 1. — Ventral view; 2. Tarsus I dorsally. Fig. 3-4 : *Chaetodactylus* (*Achaetodactylus*) *leleupi* FAIN. Hypopus : 3. — Ventral view; 4. — Tarsus I dorsally.

on tergite I (date 6-VI-1967 to 17.VI.1967. Coll Dr. Daly). Also from *Ceratina diloloensis*; bee n° 242 A, 20.VII.1966 (18 hypopi beneath the head) and from *Ceratina spilota* (12 hypopi) both from Bambui, near Bamenda, West Cameroun. All hypopi collected by Dr. H. Daly. Holotype in Musée de Tervuren. Paratypes in I. R. S. N. B.

3. Chaetodactylus (Chaetodactylus) dalyi FAIN, 1974

H y p o p u s (Figs. 5, 6, 11). — Holotype 320 μ long 255 μ wide. In two paratypes 298 μ × 220 μ and 305 μ × 240 μ. D o r s u m : Dorsal plates with numerous short curved striations. Propodonotal plate wider (160 μ) than long (72 μ). Dorsal setae thick the longest are 45 μ long; *sc e*, *h*, *l 1*, *l 2*, *l 3* distinctly longer (40-45 μ) than *sc i*,*d 1* to *d 3* (20-30 μ). The

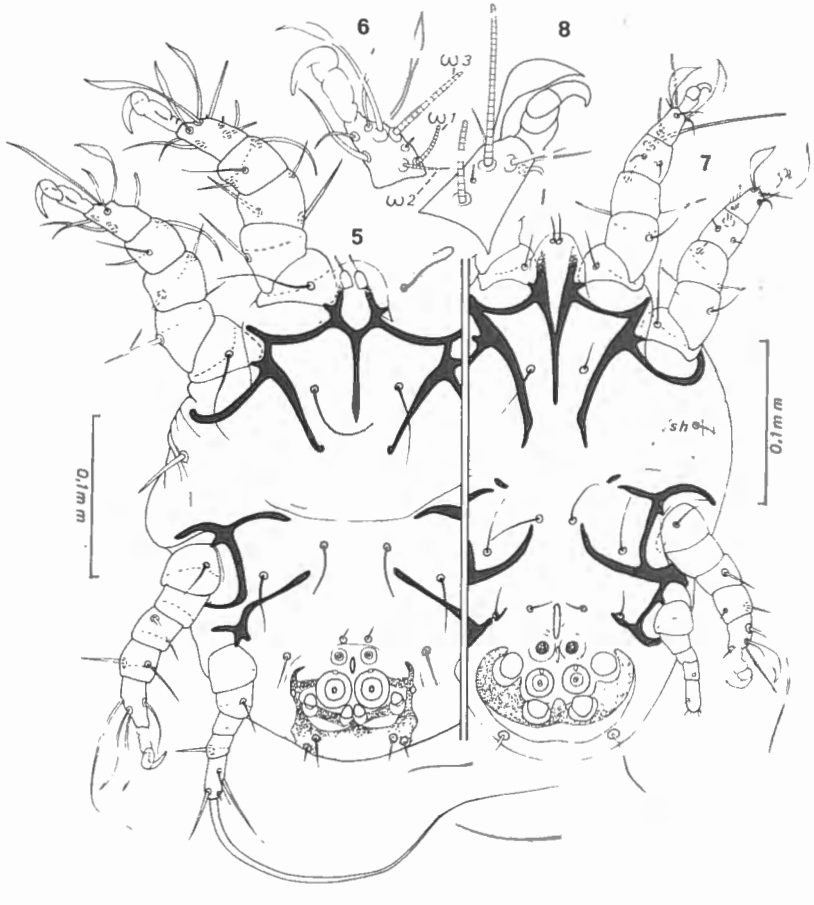

Fig. 5-8. — Fig. 5-6 : *Chaetodactylus* (*Chaetodactylus*) *dalyi* FAIN. Hypopus : 5. — Ventral view; 6. — Tarsus I dorsally. Fig. 7-8 : *Chaetodactylus* (*Ochaetodactylus*) *decellei* FAIN. Hypopus : 7. — Ventral view; 8. — Tarsus I dorsally.

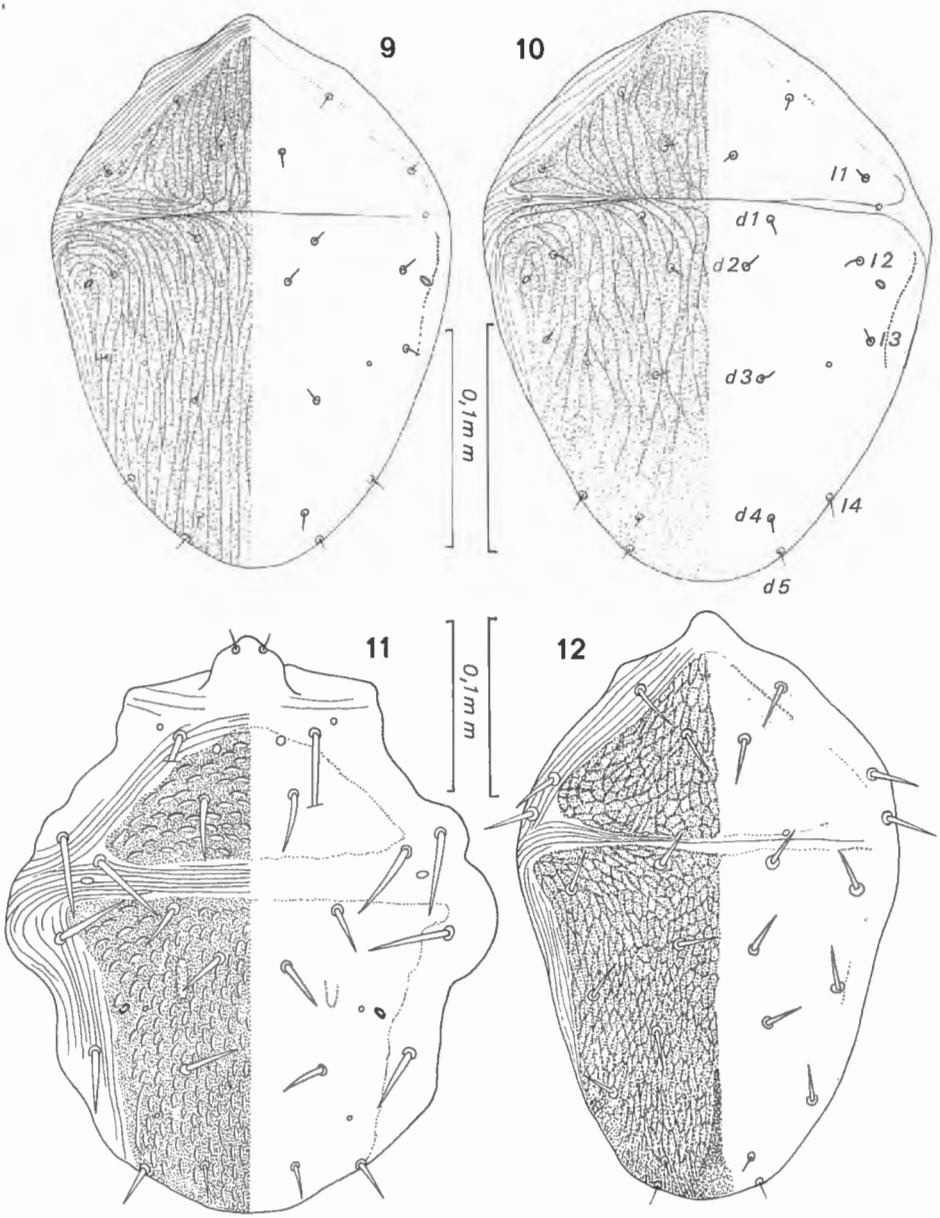

Fig. 9-12. — Dorsal view of hypopi. Fig. 9 : *Chaetodactylus (Achaetodactylus) ceratinae* FAIN. Fig. 10 : *Chaetodactylus* (*Achaetodactylus*) *leleupi* FAIN. Fig. 11 : *Chaetodactylus* (*Chaetodactylus*) *dalyi* FAIN. Fig. 12 : *Chaetodactylus* (*Ochaetodactylus*) *decellei* FAIN.

d 4 12 μ long. Venter : Palposoma consisting of 2 cylindrical cuticular processes bearing each a short solenidion *alpha*. Sternum long (48 μ). Suctorial plate 80 μ wide (width of the sclerotized frame); anterior suckers small (9 μ diameter), posterior suckers 21-23 μ wide, conoids small, lateral conoids situated slightly behind the level of the posterior suckers. Setae *d 5* 45 μ apart, *l 5* 57 μ apart. The suctorial plate is followed by a thick excavated transverse sclerite fused with the dorsal shield. Legs : Claws I longer (30 μ) than claws II-III (25 and 19 μ). Tarsus IV 28-30 μ long, 11-12 μ wide bearing a very long apical seta and several other setae less than 50 μ long. Solenidion of tibia IV long, conical.

Host and locality. — Holotype and 1 paratype from *Ceratina turneri* ♂ (bee n° 243) Natal, South Africa; 2 paratypes from *Ceratina* sp. Zimbabwe (bee n° 285) 13.III.1967 and Sta Lucia, Natal (bee n° 85) 16.VI.1967. (Coll. H. Daly). Holotype in Musée de Tervuren. Paratypes in I. R. S. N. B.

4. Chaetodactylus (Ochaetodactylus) decellei FAIN, 1974

Hypopus (Figs. 7, 8, 12). — Holotype : 315 μ long, 204 μ wide. In 2 paratypes 295 μ × 210 μ and 330 μ × 212 μ. Dorsum : Plates very large with a very distinct pattern of lines forming a network. Dorsal setae are small spines, most of them being 18 to 30 μ long. Venter : Suctorial plate very large (90 μ wide). Diameter of suckers : anterior 15 μ, posterior 16 μ. Conoids large, anterior conoids situated in front of posterior suckers. Ventral setae thin. Setae *l 5* thin, 65 μ apart. Legs : Tarsus IV longer (18-20 μ) than wide (8-9 μ) bearing 1 long apical seta and 3 microsetae. Solenidion ω 2 absent. Claws I-III 18 μ long. Genu I with 2 spines as long as the genu. Tarsi I-III with 2 foliate setae.

Host and locality. — Holotype and 2 paratypes (hypopi) from *Ceratina* sp. (bee n° 205B), Ngurdoto National Park. Tanzania. Also from *Ceratina spilota* ♂ (bee n° 235A) Babmui, Western Cameroun (4 paratypes) 20.VII.1967; *Ceratinae aereola*, Lusambo, Zaïre (1 paratype) and *Ceratinae excavata* ♀ (bee n° 207), Ngurdoto, Nat. Park, Tanzania (5 paratypes). (Coll. H. Daly). Holotype in Musée de Tervuren. Paratypes in I. R. S. N. B.

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