

vraisemblable que l'indication de provenance est erronée et qu'il s'agit d'une forme étrangère à la faune égyptienne, probablement asiatique. Il ne s'agit d'aucune des espèces reprises dans ma révision des formes africaines du genre (Trans. Roy. ent. Soc. London, 107, 1955, pp. 95-116).

**Epomis nitidicollis** MOTSCHULSKY (p. 345).

Holotype ♀. — Cap de Bonne-Espérance.

= **Chlaenites capicola** (CHAUDOIR 1856) (**syn. nova**).

Synonymie établie après examen des deux types. La description de cet *Epomis nitidicollis* a échappé à tous les auteurs ultérieurs, aussi bien à CHAUDOIR (Monographie des Chléniens, 1876) qu'à GEMMINGER et HAROLD et à CSIKI.

**Poecilostus prolongatus** MOTSCHULSKY (p. 349).

Holotype. — Sénégal.

= **Macrochlaenites elongatus** (LAFERTÉ 1851) (**syn. nova**).

Le type de MOTSCHULSKY n'a plus d'avant-corps, néanmoins la synonymie est certaine.

VII. *Énumération des nouvelles espèces de Coléoptères rapportées de ses voyages. 4<sup>e</sup> article (suite)*

(Bull. Soc. imp. Natur. Moscou, 38, n° 2, pp. 227-313)

**Caminara arabica** MOTSCHULSKY (p. 304).

Holotype ♂. — Arabie.

= **Caminara imbricatum** (KLUG 1832).

Cette synonymie a déjà été signalée par S. BREUNING en 1927.

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Tervuren.

NOTES ON PALAEARTIC NEMORIUS  
(DIPTERA : TABANIDAE)  
WITH DESCRIPTION OF ONE NEW SPECIES

by **Cornelius B. PHILIP** \*

Recent studies by MOUCHA and CHVÁLA (1959), LECLERCQ (1960) and ABBASSIAN-LINTZEN (1960) have revealed that more speciation has occurred in the interesting Old World genus *Nemorius* RONDANI, especially in the Middle East where the species may constitute livestock pests, than had been generally recognized since its description a century ago. Though it was placed as a subgenus or synonym of *Chrysops* by several authors, including KRÖBER (1939), MACKERRAS (1955) and others, OLSUFIEV (1937) was more nearly correct in relating it to *Silvius* MEIGEN with which, he however, synonymized it. Recent authors have returned *Nemorius* to full generic status; in my opinion this is confirmed by study of several species, several of which were generously supplied by Dr. ABBASSIAN-LINTZEN.

The small, slender, gray-bodied species have obvious similarities to the western Nearctic *Silvius quadrivittatus* group (PHILIP, 1959). As PHILIP and MACKERRAS (1961) have pointed out, apparently primitive elements of *Silvius* without frontal or facial callosities in the females, have persisted in eastern Asia and were assigned to a new subgenus *Neosilvius*. A burst of speciation in western North America, resulting in the above closely-knit group, could have resulted from precursors that crossed one of the Behring bridges in the Pleistocene era. It appears possible that a similar burst of speciation occurred from *Nemorius* ancestors toward the Middle East and central Europe.

(\*) U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Rocky Mountain Laboratory, Hamilton, Montana.

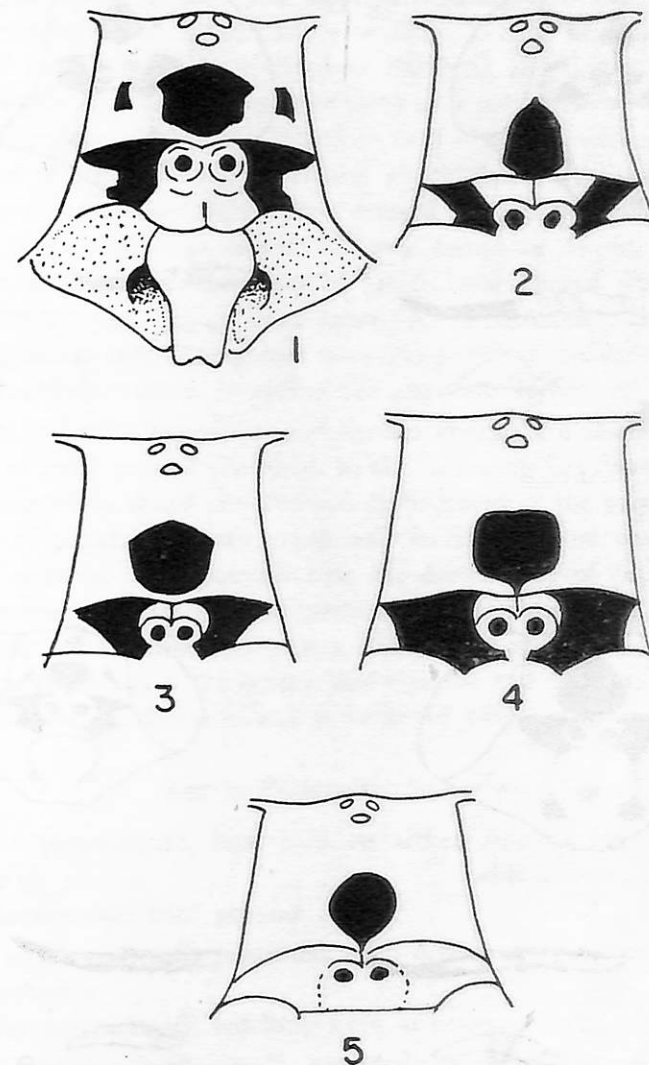
Generic separation is supported by the modern differences in the female eye patterns — freckled or mottled in *Silvius* and ringed with a central spot or isolated bar in *Nemorius* — and further augmented by consistent differences in the facial and parafacial calli, and often in widths of fronts (Figs. 1-5). Though similarities are often seen in the shapes of the frontal callosities and postocular rims, the palpi are less often grooved in *Silvius s. str.* than in *Nemorius*, though two species of subgenus *Griseosilvius* (see below) also have them. The systematic significance of differences in proportions of antennal segments has become less apparent, especially in view of the unusually long pedicel in Nearctic *Silvius* (*Zeuximyia philipi* PECHUMAN (MACKERRAS, 1955, fig. 18) which has freckled eyes like other *Silvius*; however, a lateral constriction or pseudoannulation occurs in *Nemorius* on each of the scape and pedicel which is seldom seen in *Silvius*. Comparative studies of genitalia of the two genera may reveal supporting evidence for separate maintenance, as suggested by differences in the tergal plates, eighth sternites and ends of the spermathecal ducts of females figured by SHEVSHENKO (1960) for *N. vitripennis*\* and by MACKERRAS (1955) for *S. vituli*. A check of other species will be required to decide if these differences are of generic significance.

The eye patterns and other head characters, in spite of the short antennal pedicels, indicate also that *Silvius irritans* RICARDO (Fig. 6) and *S. sharpuricus* ABBASSIAN-LINTZEN (Fig. 7) from Iran should be transferred to *Nemorius*. The latter species was originally compared with and differentiated from *S. latifrons* OLSUFIEV from Caucasus which has freckled eye spots and no lateral calli.

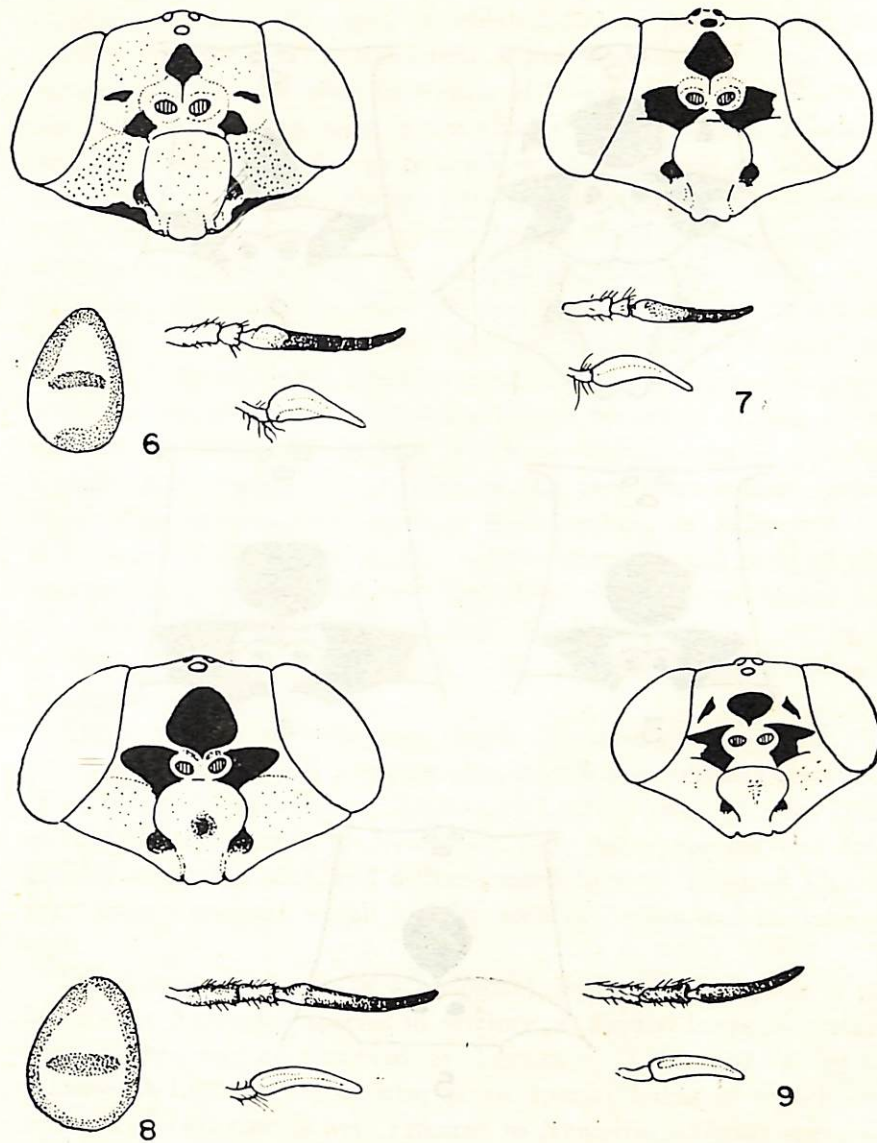
There appears also to be a biological distinction in habits of at least some *Nemorius* species in settling on animal hosts like horn flies, *Lyperosia*, as observed by LECLERCQ (1960, and in litt.). ABBASSIAN-LINTZEN (1960) also noted special forms of attack on animals of two species here referred to *Nemorius*. *Silvius* species, to my knowledge, do not attack animals in swarms.

Because of these new restrictive characters, particularly the eye pattern, it is now evident that the two specimens listed by PHILIP

(\* Five females generously furnished by SHEVSHENKO from Kazakistan and Uzbekistan have proved to be *N. horvathi* SZILADY.



Figs. 1-5. Fronts of females of : 1. *Nemorius vitripennis* (plus face), 2. *N. caucasicus*, 3. *N. horvathi*, 4. *N. klapperichi*, and 5. *N. abbassianae* (adapted from LECLERCQ, 1960).



Figs. 6-9. Fronts, faces, antennae and palpi of : 6. *N. irritans* (plus eye pattern), 7. *N. shapuricus*, 8. *N. fallottii* (plus eye pattern), and 9. *N. bouvieri*.

and AITKEN (1958) from Sardinia are not conspecific with *N. vitripennis* and those by PHILIP (1959) from Iran actually represent an undescribed species. The small, irregular, bare spots seen on either side of the frontal callosity (Fig. 1) and sometimes connected to it in true *N. vitripennis* (MOUCHA and CHVÁLA, 1959), were aptly labelled by SZILADY (1926) as « nebencalli ». The bare calli found on all but one (possibly two) of the *Nemorius* species laterad of the antennal insertions, which obscure the usual subcallus of most tabanids, are here termed the « parantennal calli » (PHILIP, 1959). The closest to these found in *Silvius* are the upper parafacial calli possessed by *S. matsumurai* KONO and TAKAHASI (1939, Fig. 1) from Japan. As is customary, the antennal segments are here referred to as : scape=first, pedicel=second, and flagellum=third, including the annulate style.

Details in the descriptions of certain species are insufficient to allow of more precise placement in the following key, particularly with regard to shape of palpi and distinctness of the groove, condition of parafacial pores, apodemal (facial) pits and basal abdominal pattern. It is possible that the consistency of presence of spur-veins may also have supplemental systematic value, as may the shape of the median eye spot and discontinuance of marginal band inwardly with thickening below in the eye pattern. Because of variation, *N. horvathi* had to be keyed twice.

Key to Palaearctic *Nemorius*

1. No parantennal, bare calli on either side of the antennae (Fig. 5) . . . . . *abbassianae* LECLERCQ  
 Parantennal calli present . . . . . 2
2. Parantennal calli separated from ocular margins, sometimes narrowly . . . . . 3  
 Parantennal calli touching eyes at outer corners . . . . . 5
3. Parantennal calli small, rounded; parafacial (genal) pores coarse and prominent; a pair of small bare spots at the ocular corners of the subcallus; thoracic and abdominal patterns indistinct; palpal grooves shallow (Fig. 6). *irritans* (RICARDO)  
 Not with this combination of characters, the parantennal calli angular in outline; thoraxes distinctly lined; palpi grooves variable . . . . . 4
4. Wing veins and halteres brown; short spur veins often at

- bases of veins R<sub>4</sub>; antennae distinctly longer than fore tibiae, pedicel about twice as long as thick (Fig. 3). *horvathi* SZILADY [Wing veins and halteres yellow, no spur veins; antennae shorter, about as long as fore tibiae, pedicel but little longer than thick (Fig. 7) . . . *shapuricus* (ABBASSIAN-LINTZEN)
5. (2) Parantennal calli deeply notched on the outer, lower margin; frontal « nebencalli » usually present . . . . . 6  
No nebencalli or deep lateral notches on the parantennal calli (shallow notches may be present in *caucasicus*) . . . . . 7
6. Size small, 5.5-8 mm.; front with mostly pale hairs and «nebencalli », when present, consisting of slender diagonal dashes; parafacial pores fine and sparse; thorax plainly lined; abdomen predominantly pale reddish basally above and below (Fig. 9) . . . . . *bouvieri* n.sp.  
Size larger, 10-13 mm.; frontal hairs mostly black; « nebencalli » triangular or irregular; thorax predominantly dark with indistinct gray lines; parafacial pores coarse and numerous; abdomen predominantly gray (Fig. 1) . . . . .  
. . . . . *vitripennis* (MEIGEN)
7. Antennae short, about equal to fore tibiae in length, pedicels but little longer than thick; frontal vestiture and parantennal calli reduced (Fig. 2). . . . . *caucasicus* (OLSUFIEV)  
Antennae plainly longer than fore tibiae, and pedicels about twice longer than thick; frontal hairs more evident; parantennal calli larger, occupying all of upper subcallus except narrow areas immediately above antennae . . . . . 8
8. Frontal callosity large, subquadrate, the parantennal calli unusually large (East Afghanistan) (Fig. 4). . . . .  
. . . . . *klapperichi* MOUCHA and CHVÁLA  
Frontal callosities 5- or 6-sided, or tall ovoid; parantennal calli moderate . . . . . 9
9. Palpi slender, about 5 times longer than thick, with shallow groove; facial pits large, black; parafacial pores indistinct; notum dark with 2 narrow, gray admedian lines; tergite 1 with large, black median spot wider than scutellum (Fig. 8) . . . . . *fallottii* (KRIECHBAUMER)  
Palpi thickened basally to about one-third their length, with deep groove; facial pits small, dark gray; parafacial pores coarse, distinct; notum gray with 4 dark lines; tergite 1 with maculation reduced . . . . . [some *horvathi*]

### *Nemorius fallottii* (KRIECHBAUMER) (Fig. 8)

This species has long been synonymized with *Nemorius vitripennis* MEIGEN. After I decided that the two females listed under the latter name by PHILIP and AITKEN (1958) from Monte Acuto and Ponte Flumendosa, Sardinia, were actually different, though related, the flies were described in manuscript as *N. leclercqi* n. sp. which accounts for the notice of this name by LECLERCQ (1960, Mem. Inst. Roy. Sci. Nat. Belg., Ser. 12, Fasc. 63, p. 38, footnote). It was later learned from Professor Doctor Frans KÜHLHORN of Munich Zoological Museum that the type of *Haemophila fallottii* KRIECHBAUMER from northern Italy likewise lacked frontal nebencalli and lateral notches on the parantennal calli.

The name must therefore be revived, thus eliminating intended dedication of the species to my friend, Dr. Marcel LECLERCQ. It is nevertheless worthwhile to redescribe the species. Three additional females collected in Bastia and Callacucci, Corsica, by Professor J. DAVID were studied through courtesy of Dr. E. ROMAN of the University of Lyon.

Females, 6.5 to 8 mm. A small, grayish-bodied species with practically clear wings, front with callosity usually tall ovoid and no nebencalli; parantennal calli without lateral notches; parafacial pores indistinct.

Eyes bare, with a median heavy bar, and a heavy marginal circle, notched in the upper corner (relaxed, Fig. 8). Postocular rim wider than in *N. vitripennis*. Frons wider than tall, index 1:0.8, convergent above, buffgray pollinose, darkened about the three ocelli at vertex, with scattering black and pale hairs; callosity black, ovoid or rounded, no nebencalli. Subcallus shallow above antennae. Parantennal calli black, triangular, touching eyes, without deep lateral notches. Face and cheeks buff-gray pollinose with sparse pale hairs and a small median, dark spot. Apodemal pits large, deep, black. Parafacial pores not usually prominent. Antenna black, distinctly longer than fore tibia; scape and pedicel each about twice longer than thick, the former constricted in the outer third, the latter in the middle; flagellum slender and about a third longer than the two basal segments combined. Palpi flesh-pink, whitish-haired, but little thickened

basally, about five times longer than thick, groove long but shallow.

Notum and scutellum blackish-gray with two rather short, narrow admedian, buff-gray lines anteriorly, and marginal ones pale gray in front of wing bases but no median one. Fore coxae and femora dark grayish brown; tibiae red, darkened on distal third of fore pair and extreme apices of the others; mostly white-haired. Wings faintly tinted, venation normal, stigma more prominent than in *N. vitripennis*. No spur veins. Halteres reddish brown.

Abdomen ash gray with paler incisures. Dull black maculations: largest on tergite 1, undivided and broader than scutellum; on t. 2 two transverse, moderately-separated, basal crescents, reduced to less than half the length of the tergite; and on t. 3 two very narrow, widely-separated, basal transverse lines. Hairs sparse, predominantly pale yellow, dark only on above-mentioned spots.

Compared to *N. vitripennis*, this species lacks the nebencalli on the front, the prominent parafacial pores, and lateral notches in the parantennal calli; the palpi are more slender basally, and the abdominal pattern is more reduced, or in one female darker, the median gray triangles on tergites 2 and 3 are equilateral with wider bases.

= ***Nemorius bouvieri* n.sp.** (Fig. 9)

A small, gray-bodied species with pinkish sides, prominently-lined thorax, clear, yellow-veined wings, notched parantennal calli and front usually with nebencalli.

Holotype ♀, 5.5 mm. Eyes bare, pattern as in the above but not as heavy (relaxed); postocular rim broad. Front wider than tall, convergent above, index 1:0.8, buff-gray pollinose, darker about the three very compact ocelli, mostly white-haired. Callosity black, brown on the disc, a little broader than tall, rounded, flanked on each side with nebencalli as slender diagonal, isolated lines. Subcallus very shallow above antennae; parantennal calli black, touching the eyes, triangular but with even more pronounced lateral notches than in *N. vitripennis*. Face and cheeks buff-gray pollinose and sparsely pale pilose; apodemal pits small; parafacial pores hardly discernible. Antennae black, shape and proportions as figured. Palpi pale orange and pale-haired, somewhat thickened basally and with short grooves.

Thorax gray with four dark lines dorsally, nearly the full length of the notum. Legs as *N. fallottii*. Wing veins yellow basally, brown outwardly. Short spur veins present on bases of R<sub>4</sub>; stigma reduced. Halteres dark brown.

Abdomen pinkish on sides of the first three segments, darker thereafter with pale incisures. Dull blackish maculations: crossing tergite 1, undivided and wider than scutellum; geminate and nearly crossing t. 2 and enclosing a tall gray triangle; and nearly crossing t. 3, but divided by a gray median band.

Bar, Iran, 30.VI.1956. F. SCHMID. In the Institut Galli-Valerio, Lausanne, Switzerland; the species is named for the Director, Dr. G. BOUVIER, who supplied this and the following paratypes for study.

Paratype ♀'s, 5.5 to 8.6 mm., same data as holotype; in the collections of Drs. BOUVIER, ABBASSIAN-LINTZEN, LECLERCQ, MACKERRAS, and the author. Nebencalli vary from more prominent than the type in one (Fig. 9) to traces or none in three. The spot on the fronto-clypeus may be more or less developed than on the type; in one, the abdominal pattern is also heavier.

As indicated in my previous report (1959), the head characters of this relate it to *N. vitripennis*, but the separation of other Iranian species now convinces me that the differences keyed justify separation of this as more than a variant. This differs from *N. caucasicus* in longer antennae and scapes, and more extensive parantennal calli; from *N. klapperichi* in more rounded callosity and less extensive parantennal calli; and from *N. horvathi* in smaller palpi and pinkish-sided abdomen. The average smaller size, deeply notched parantennal calli and usually more pinkish sides are distinctive from all.

COMMENT

I have a female from « Lyonnaise », France for comparison with the species described above, which agrees in detail with MEIGEN's two syntypes of *Chrysops vitripennis* from « Allemagne » in Paris Museum seen and compared by me in 1953.

Since *Nemorius* was erected for only *Chrysops vitripennis* MEIGEN, and is thus monobasic, ENDERLEIN's (1925) invalid assignment of the peculiar, hairy-eyed *Chrysops singularis* MEIGEN as genotype is not understood (neither is synonymizing of the

latter by KRÖBER (1939) under the later *Mesomya maroccanus* BIGOT though synonymy of the two under *Silvius* has been reaffirmed by LECLERCQ, *op. cit.*).

« *Chrysops* » *ranzonii* SCHINER, from the environs of Vienna, is another listed synonym of *N. vitripennis* which is, however, not of likely concern here.

*Silvius caucasicus* subspecies *molitor* was described by BOGATSEV and SAMADON (1949, « Isv. AN Azerb. SSR, 5: 67 », cited by but not then available to MOUCHA and CHVÁLA, 1959) from southern Transcaucasus. This was redescribed by HAUSSER (1960) from Nakitchevan ASSR and translations were made available to me through Drs. LECLERCQ and ABBASSIAN-LINTZEN. It was transferred to *Nemorius* by MOUCHA and CHVÁLA. Since the location is just across the northern Iranian border, comparison of specimens will be necessary to determine its distinctness from *N. abbassianae* to which *molitor* is obviously related by lack of parantennal calli, noticeable genal pores and similar antennal proportions. This described variety appears to be distinguished in the description by the ovoid, taller-than-broad callosity, and abdominal pattern reduced to tergite 2. On these characters, at least, *molitor* appears to deserve specific rather than subspecific separation from *caucasicus*.

It is increasingly evident that proportions of antennal segments cannot be relied on for generic separation of these chrysopine flies, an observation substantiated by MACKERRAS (1955), whereas differences in the composition of the eye pattern have increased in significance. Minor variation is apparent among *Nemorius* species in the heaviness of the pattern. The marginal circle may be incomplete along the inner margin (Fig. 6) or notched above (Fig. 8), and the central spot may be rounded, as in *N. shapuricus*, or elongate, though always isolated in those that I have relaxed. An assessment of variation in this character is needed in longer series, and preferably in fresh condition.

A comparison of the eye pattern of *Nemorius* with the peculiar freckled ones of *Silvius*, and the irregular but consistently patterned spots of *Chrysops* spp., suggest that *Nemorius* probably evolved earlier and farther from common ancestral stock than might be supposed from resemblance to certain, gray-bodied *Silvius*. Wide divergence geographically in the Old and New Worlds between *Nemorius* and the *quadrivittatus* group of *Silvius*

may have followed the pattern of dispersal from an Asiatic source discussed by SCHMIDT (1946) under the influence of Pleistocene glaciation. In spite of this apparent parallel development in these two elements, including even pseudoannulations on basal antennal segments and grooved palpi in two *Silvius*, it is noted that no *Nemorius*-like eye pattern has evolved in any Nearctic species of *Silvius*.

Of the Nearctic species of *Silvius*, yellow, western *S. gigantulus* (LOEW) shows remarkable resemblance to the Old World genotype, *S. vituli* (FABRICIUS), and, even more so in the rare *S. microcephalus* WEHR, restricted to southern Colorado, with its entirely pollinose face. None of these has grooved palpi. From those Nearctic *Silvius* s. str., the western gray-bodied *quadrivittatus* group are set apart in bi- or quadristriate abdominal patterns, lined thoraces, and wings with isolated clouds and prominent stigmas almost crossing cells R<sub>1</sub>. The females of only two of this distinctive group, *S. notatus* (BIGOT) and *S. abdominalis* PHIL., have *Nemorius*-like, grooved palpi. Also included in this group are *S. quadrivittatus* (SAY) and its variety *texanus* PECHUMAN, and *S. pollinosus* WILLISTON and its variety *jeanae* PECHUMAN. Analogous to Nearctic subgenus *Zeuximyia*, which is distinguished by the two unusually lengthened, basal antennal segments, grooved palpi, and the abdominal pattern more like *Nemorius*, the rather compact *quadrivittatus* group can also be distinguished subgenerically by the foregoing characters. *Silvius* subgenus *Griseosilvius* nov. is therefore proposed with *S. quadrivittatus* (SAY) as subgenotype for this distinctive Nearctic group.

#### SUMMARY

A new species of Old World *Nemorius* is described, *N. bouvieri* from Iran. Transferred to this genus are *Silvius irritans* RICARDO and *S. shapuricus* ABBASSIAN-LINTZEN also from Iran. *N. fallottii* KREICHBAUMER from Sardinia, Corsica and Northern Italy is revived from previous synonymy under *N. vitripennis* MEIGEN. A key to the nine species is provided. *Silvius* subgenus *Griseosilvius* nov. is proposed for *S. quadrivittatus* (SAY) and its Nearctic relatives.

The assistance of several students of the Old World fauna is gratefully acknowledged: Drs. ABBASSIAN-LINTZEN, LECLERCQ,

MOUCHA, SHEVSHENKO, ROMAN and BOUVIER, as indicated in the text. Drs. MACKERRAS of the Queensland Institute for Medical Research and WENZEL of Chicago Natural History Museum also supplied information.

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NOUVEAUX HOTES  
ET NOUVELLES LOCALITES DE CAPTURE  
DE GREGARINA CRENATA (BHATIA ET SETNA)  
(GREGARINIDAE)

par P. JOLIVET

Deux Grégarines du genre *Gregarina* sont bien connues comme parasitant les Chrysomélides et quelques Curculionides: *G. munieri* (A. SCHNEIDER) et *G. crenata* (BHATIA ET SETNA). La première semble parasiter en Europe et en Afrique presque toutes les sous-familles de Chrysomélides (sauf peut être les *Donaciinae*, les *Sagrinae* et quelques autres sous-familles primitives), la seconde limitée aux *Chrysomelinae*, *Galerucinae* et *Alticinae*. Bien qu'on ne sache rien des Grégarines de Chrysomélides en Amérique tropicale, *G. crenata* semble pantropicale, puisqu'elle était connue des Indes (1) et du Congo (2). Il se pourrait bien que la Grégarine des *Diabrotica* nord-américains (3) soit aussi *G. crenata* et non *G. munieri* comme l'avais pensé J. THÉODORIDÈS (4). Au cours de diverses missions à l'étranger, nous avons eu l'occasion de la découvrir chez divers Galéruces du melon (comme c'était le cas aux Indes) dans les différents pays suivants :

1. Taiwan (Formosa): Chao-Chow (Ping-Tung Hsien), 2.II. 1957, chez *Pseudocophora* sp. apud *perplexa* BALY.
2. Philippines: Bacsil (Ilocos Sur, Luçon). 26.VIII.1957, chez *Aulacophora* sp.
3. Ethiopie: Wonji (Shoa), 11.IV.1961.  
*Leptaulaca vinula* EICHS; *Monolepta pauperata* EICHS;  
*Aulacophora africana* WEISE.

(1) B.L. BHATIA et S. SETNA, Parasitology, XVI, 1924, pp. 284-287.

(2) J. THÉODORIDÈS et P. JOLIVET, Expl. Parc Nat. Albert, II, 8, 1959, pp. 41-46.

(3) M. WATSON-KAMM, J. Parasitology, IV, 1918, pp. 159-163.

(4) J. THÉODORIDÈS, Ann. Parasit. XXIX, 1954, pp. 596.