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New Records of Symphyla from Central and Southern Europe

by

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Synopsis: The author has studied some collections of Symphyla from Austria, Italy, France, Switzerland, Yugoslavia and Greece from zoogeographic and taxonomic points of view. Locality and habitat records are given for 294 specimens of 15 different species, mainly from the two first mentioned countries. Five species are reported from Austria for the first time, four from Italy, one from France and one from Yugoslavia. The distribution of the species are discussed. Taxonomic remarks are given in several cases, especially for the *Scutigerella*-respresentatives. *Scutigerella echinostylus* n. sp. is described and its taxonomic status discussed.

For a very long time the distributional patterns of the Symphyla have been overlooked in nearly all countries. This is peculiar since every zoologist studying humid, subhumid or semiarid soils by invertebrate sampling methods must meet them both in tropical and in temperate regions. In this situation I am in the belief that the following list of localities and the summarized distribution records of the species involved should be of interest in filling an actual deficiency in the European faunistic literature.

The records below are the result of a study of some European collections sent to me for identification during several years. The main part of the samples are from Austria and Italy and have been brought together by several zoologists, chiefly from the Zoological Institute of the University of Innsbruck. Besides there are included some samples from France, Switzerland, Yugoslavia and Greece. Unless indicated differently in the lists of localities the specimens are lodged in the collections of the Institut für Zoologie der Universität Innsbruck, Universitätsstraße 4, A-6020 Innsbruck.

Altogether 294 specimens have been studied: 34 of them belonging to 6 different species of the family Scolopendrellidae and 260 animals belonging to 9 species of the family Scutigerellidae. One of these latter species, *Scutigerella echinostylus*, is new to the science and has been diagnosed and discussed below.

Fam. Scolopendrellidae

Gen. *Scolopendrellopsis* BAGNALL

1. *Scolopendrellopsis (Scolopendrellopsis) microcolpa* (MUHR, 1881)

Yugoslavia. — Istria, Ankaran, under stones, without date, 1 ad.[1] (♂), (Loc. Ju-66/12; leg. Hofer).

1 specimen: 1 ad. (♂).

The distribution of this rare species is very incompletely known but it seems likely that it has a comparatively small area probably restricted to western Europe and the Mediterranean. Thus MUHR (1881) reported it from near Praha in Czechoslovakia, HANSEN (1903) from Palmi in southern Italy, REMY (1943) from the Vosges in France and from another locality near Kotor in southern Yugoslavia and lastly AUBRY & MASSON (1952 a and b) from some localities in Algeria. These scanty records are the only ones announced up to now, the above new record thus filling one of the gaps of the present distribution map.

2. *Scolopendrellopsis (Symphylellopsis)*[2] *balcanica* (REMY, 1943)

Greece. — Korfu, macchia W of Kassiopi, terra rossa, automatical extraction, 17. IV. 1960, 1 ad. (sex?), 2 juv. 9, 4 juv. 8, (Loc. Ko-60/18, -60/19 and -60/21; leg. Hauser).

Altogether 7 specimens: 1 ad. (sex?), 6 juv.

The species has not often been met with. REMY described it in 1943 on three specimens, two of them from Novi-Pazar in southern Yugoslavia and one from Kalabáka in Thessaly. Then it has been collected at Le Vigan and Lattes in southernmost France by R. CHARDARD (CHARDARD 1947), in Algeria, near Summeur and in the front of Akfadou, by P. REMY (AUBRY & MASSON 1952 b) and on the Balearic Islands, at Mahon and Mercadal, by M. H. COIFFAIT (JUBERTHIE-JUPEAU 1961). The latter author also mentions it from central France, however without giving any exact locality. Excluding this notice only 10 specimens have been gathered before those reported above.

3. *Scolopendrellopsis (Symphylellopsis) subnuda* (HANSEN, 1903)

Austria. — Salzburg, Lofer Grubhof, heap of manure in a garden, depth 15 — 20 cm, 5. V. 1948, 1 juv. 10, (Loc. D 14/15—20; leg. Franz). — Oberösterreich, Lambach, heap of manure in a garden, depth 8—12 and 13—17 cm, 27. VIII. 1948, 1 ad. (♀), 1 juv. 8, (Loc. D 21/8—12 and D 21/13—17; leg. Franz). — Steiermark, Enns valley, Admont, in a field, depth 6—10 cm, 7. VI. 1948, 1 juv. 9, 1 juv. 8, (Loc. D 23/6—10; leg. Franz).

[1] Abbreviations: ad. = a specimen with the maximum number of legs; juv. ... = a juvenile specimen with the number of pairs of legs indicated.

[2] The taxonomical limits of this genus is discussed by the present author in Symphyla from Ceylon and the Peninsular India (in press). BAGNALL's *Scolopendrellopsis* is there subdivided into two subgenera *Scolopendrellopsis* s. str. and *Symphylellopsis*.

Greece. — Korfu, macchia W of Kassiopi, 17. IV. 1960, 1 juv. 11, 3 juv. 10, 1 juv. 9, 1 juv. 8, (Loc. Ko 60/19, 60/20 and 60/21; leg. Hauser).

Altogether 11 specimens: 1 ad. (♀), 10 juv.

S. subnuda is ingenuous in Europe and North Africa and occurs as an introduced species on Hawaii. Though it is very wide-spread and often met with in several European countries, the Greek locality is the second one from that country.

Gen. *Symphylella* SILVESTRI

4. *Symphylella elongata* SCHELLER, 1952

Austria. — Oberösterreich, Lambach, heap of manure in a garden, depth 6–10 cm, 7. VI. 1948, 3 juv. 8, (Loc. D 23/6–10; leg. Franz). — Ibidem, depth 2—6 cm, 27. VIII. 1948, 1 juv. 8, (Loc. D 21/2—6; leg. Franz).

Altogether 4 specimens (all juv.).

Besides the two adult from southernmost Sweden (SCHELLER 1952) the present author has studied material from another Swedish locality and some ten adult specimens and several juvenile ones from the Kaiserstuhl district in southwestern Germany (partly reported in SCHELLER 1962). But it is likely that the distribution area extends over southern Europe, since some authors have studied juvenile *Symphylella* specimens from there, which in all probability must be referred to *elongata*. Such records, not quite fully supported, are Corsica (HINSCHBERGER 1953), the eastern Pyrenees (ROCHAIX 1954) and the Balearic Islands (JUBERTHIE-JUPEAU 1961). Thus the species has not yet been found outside Europe.

5. *Symphylella major* SCHELLER, 1961

Austria. — Nord-Tirol, Erlspitze, the top-area, 2400 m a. s. l., 24. V. 1965, 1 ad. (♂), (leg. Thaler). — Nord-Tirol, near the top of Patscherkofel, under stones surrounded by moss and lying superficially near the border of a melting snowpatch, 2250 m a. s. l., 26. VI. 1965, 1 ad. (♀), (Loc. nT-65/10 a; leg. Thaler).

Switzerland. — Canton de Berne, Simme valley, Oberwil, Zwerglichilchli, 1220 m a. s. l., 6. VIII. 1962, 1 ad. (♀), (Loc. BE 47; leg. Strinati and Aellen; deposited in the Zoological Museum of the University of Lund, Sweden).

Altogether 3 specimens: 3 ad. (1 ♂, 2 ♀♀).

S. major has not been reported previously outside its type locality in the westernmost part of Switzerland (SCHELLER 1961). Perhaps it is a true mountainous species, since the localities hitherto known are all situated in the Alps, within the 1000—2400 meter level. However, no astonishment should arise if it should be discovered in the lowlands too, partly because most symphylids are more or less euryzonal and partly because the knowledge of the Scolopendrellidae fauna of the Alps is still extremely limited.

6. *Symphylella vulgaris* (HANSEN, 1903)

Austria. — Oberösterreich, Lambach, heap of manure in a garden, depth 2—6 and 13—17 cm, 27. VIII. 1948, 1 juv. 10, 1 juv. 8, (Loc. D 21/13—17 and D 22/2—6;

leg. Franz). — Steiermark, Enns valley, Admont, in a field, depth 15 cm, 7. VI. 1948, 1 juv. 8, (Loc. D 23/1—5; leg. Franz). — Hallermauern, Sattleralm, 3. X. 1948, 1 juv. 10, (Loc. x 1049 c; leg. Franz).

France. — Départment de l'Ain, Echallon, the Maduré cave, 2. VIII. 1964, 1 juv. 10, (leg. Colin).

Yugoslavia. — Istria, Rovinj, 22. VIII. 1958, 1 juv. 10, (Loc. Ju-58/3; leg. Pechlaner). — Istria, Ankaran, under stones, without date, 1 subad. 11 (♀), (Loc. Ju-66/12; leg. Hofer).

Greece. — Korfu, macchia W of Kassiopi, 17. IV. 1960, 1 juv. 9, (Loc. Ko 60/21; leg. Hauser).

Altogether 8 specimens: 1 subad., 7 juv.

This is one of the most widely distributed symphylid species we know.

Fam Scutigerellidae

Gen. *Scutigerella* RYDER

7. *Scutigerella alpina* ROCHAIX, 1955

Italy. — Lago di Garda district, Val Ledro, between Bezzecca and Mt Vies, thick spruce forest with sparse forest floor vegetation, under stones and logs, c. 1200—1600 m a. s. l., 26. V. 1963, 1 ad. (♂), (Loc. Ga-63/3; leg. Thaler). — Lago di Garda district, Riva — St. Barbara, foliiferous shrubs, mostly hazel, under stones in the förna, c. 500 m a. s. l., 30. V. 1963, 1 ad. (♂), (Loc. Ga-63/22; leg. Thaler). — Valsugana valley, Borgo, Val Sella, low scrubs with *Rhododendron* and partly also a rich herbaceous vegetation, under stones and branches of wood, 750—1100 m a. s. l., 23. IX. 1965, 1 ad. (♂), (Loc. OJ-65/7; leg. Thaler).

Altogether 3 specimens: 3 ad. (♂♂).

A comparison of these specimens with ROCHAIX's type description (1955) shows that they are not identical with the single type from the Dolomites. Thus the number of the setae of the first rudimentary tergum is higher (13—15) than in the type (c. 12 according to ROCHAIX's fig. 1). On the other hand the marginal and submarginal setae of the following, anteriorly located, terga are inferior in numbers compared with those of the type. Other distinguishing characters have been traced on the antennae: The second whorl of setae and the spined organs both appear on the 7th segment in the type, but on the 8—9th and 4—5th segments respectively in the above specimens. Moreover, the numbers of the additional setae of the styli are not identical. In THALER's specimens these numbers are lower than in the type.

In the type description ROCHAIX did not mention the number of the coxal sacs. However, all specimens studied here have 8 pairs located at the bases of the 3rd-9th pairs of legs.

Besides the single adult type collected by G. MARCUZZI at Sud Cima Pramper in the Dolomites *S. alpina* has been reported only once earlier viz. from Klonovec in

southern Yugoslavia from where JUBERTHIE-JUPEAU has announced an adult female (JUPEAU 1957). In this case, however, the species identification is affected with some uncertainty as the number of the additional setae of the styli, especially posteriorly, is much lower than reported by ROCHAIX, in this respect thus partly agreeing with THALER's material.

8. *Scutigerella causeyae* MICHELBACHER, 1942

Austria. — Vorarlberg, Rhätikon, slope from the Col-Rosahütte to Girenspitze, 2200—2340 m a. s. l., 16. VII. 1961, 1 ad. (♂), (Loc. Ra-61/13; leg. Hauser). — Ibidem, in scree material from the southern slope of Kirchlispitz, 2340 m a. s. l., 17. VII. 1961, 1 ad (♂), 1 juv. 11, (Loc. Ra-61/17; leg. Hauser). — Nord-Tirol, Inn valley, Stams, N of the suspension bridge over the Inn at Simmering, relic pine forest, 20. V. 1967, 2 ad. (♂, ♀), (Loc. nT-67/2; leg. Hauser). — Nord-Tirol, Inn valley, NE of Stans, Tratzberg castle, in beech forest, under stones, c. 600 m a. s. l., 17. VI. 1967, 2 ad. (♀♀), (Loc. nT-67/5; leg. Hauser). — Nord-Tirol, the north range at Innsbruck, Frau Hitt saddle, under stones, 2250 m a. s. l., 8. VII. 1967, 5 ad. (♀♀), (Loc. nT-67/11; leg. Hauser). — Nord-Tirol, Halltal, dense beech forest, under stones in beech leaf litter, c. 1100 m a. s. l., 12. VI. 1965, 10 ad. (6 ♂♂, 2 ♀♀, 2 sex?), (Loc. nT-65/4; leg. Thaler). — Nord-Tirol, Ötztal, Obergurgl, Gaisbergtal, in front of a glacier, sparse vegetation, c. 2500 m a. s. l., 7. VIII. 1959, 3 ad. (sex?), (Loc. OG-59/3; leg. Janetschek). — Ibidem, Ochsenkopf, in a forest, grassy ground surrounding pools, 1950 m a. s. l., 21. VII. 1960, 1 ad. (sex?), (Loc. OG-60/2; leg. Janetschek). — Nord-Tirol, Rofan, near Bayreuther Hütte at the foot of the rock-face Sonnwendjoch-Sagzahn, steep, grassy slope, under stones, c. 1800 m a. s. l., 4. VII. 1966, 1 ad. (♀), (Loc. nT-66/15; leg. Thaler). — Innsbruck district, Patscherkofel, 2050 m a. s. l., 12. VI. 1966, 1 ad. (♀), 1 juv. 11, (Loc. I-66/7; leg. Hauser). — Ibidem, 18. VI. 1966, 6 ad. (5 ♂♂, 1 ♀), 1 juv. 11, 1 juv. 10, (Loc. I-66/9; leg. Hauser). — Ibidem, the peak area, 2250 m a. s. l., 18. VI. 1966, 1 ad. (♀), (Loc. I-66/10; leg. Hauser). — Nord-Tirol, Kaiser Mts, Kaiser valley, beech forest outside Lederer Alm, c. 950 m a. s. l., 9. VI. 1966, 2 ad. (♂, sex?), (Loc. Ka-66/4; leg. Hauser). — Nord-Tirol, Gschnitztal, between the Padasterjoch-Hütte and Kesselspitze, c. 2430 m a. s. l., 2. VII. 1967, 1 ad. (♂), (Loc. nT-67/8; leg. Hauser). — Ibidem, in stony scree material below Roter Kopf, c. 2300 m a. s. l., 2. VII. 1967, 1 ad. (♂), (Loc. nT-67/9; leg. Hauser). — Burgenland, Leitha Mts, Hackelsberg, waste zone in a vine-plantation, 30. IV. 1967, 1 ad. (♀), (Loc. Bu-67/1; leg. Hauser).

Altogether 43 specimens: 39 ad. (17 ♂♂, 15 ♀♀, 7 sex?), 4 juv.

Disregarding the American type locality (Durham in North Carolina) reported by MICHELBACHER (1942) the species has been announced only from Great Britain (EDWARDS 1959) and southwestern Germany (SCHELLER 1962). However, it seems to be a very common species within both these regions. EDWARDS says that it is the commonest species in Britain and my own investigations of large collec-

tions of symphylids from the Kaiserstuhl[3] in Western Germany indicate quite the same state there.

9. *Scutigerella echinostylus* sp. n.
Fig. 1

Italy. — Süd-Tirol, Schlern, the Schlernbödele-Hütte plateau, at the beginning of Gamssteig, under stone between tree branches lying on the ground, lushy grass, c. 1850 m a. s. l., 27. VII. 1966, 1 ad. (♀), (Loc. sT-66/2; leg. Thaler). — Borgo, S of Val Sugana, high plateau between Cima Undici and Cima Dodici, under stone on a grassy heath, 2050 m a. s. l., 25. IX. 1965, 1 ad. (♀), (Loc. OI-65/12; leg. Thaler).

Altogether 2 specimens: 2 ad. (♀♀).

Holotype. The adult female from Borgo. Type specimens deposited in the collections of the Zoological Institute, University of Innsbruck, Austria.

Length. — Body length (5.27—) 6.33 mm.

Head. — Rounded, with its broadest part just behind the middle; lateral angle at articulating point of mandible concealed. Central rod very indistinct and short, anterior and posterior branches vestigial; distinct oblique rods lacking at the hind margin of head. Seta in front of the posterior end of mandible (as long as —) slightly longer than the greatest diameter of first antennal segments. Dorsal surface of head with a few, small, naked areas and for the rest rather densely covered with setae of two different types. Main part of setae short or rather short and thin but nearly 40 ones are long and protruding. These latter setae reach 0.6—0.7 (0.8) of the greatest diameter of first antennal segment. Cuticle glabrous but with very faint thickenings making a vestigial net-work. Palp of first maxilla three-pronged with convex lateral borders and a contracted base. On the paratype specimen they are simply conical.

Antennae. — Left antenna with 38 and the right one with 60 segments (both antennae broken outside the 31st and 30th segment respectively by the paratype specimen). First segment about 1.8 (—2.0) times wider than long bearing only 4 primary setae: a thick one on the outer part of dorsal side and 3 thin ones on the inner part of dorsal side and the inner side. The thicker seta is longest, reaching (0.3—) 0.4 of the greatest diameter of the segment. An additional perpendicularly outstanding seta is inserted on the basal half of the inner side. Second segment nearly 2.6 (—2.7) times wider than long also having a single primary whorl here comprising 8 fully developed setae rather evenly distributed around the segment. Setae of inner side thin and straight. The proximal segments with only one whorl of setae on each segment, secondary whorl beginning on the ventral side of 7th—8th segment; 3rd whorl beginning on the ventral side of 13th—14th segment. Small spined organ and a short seta accompanying it on its outer side begin on outer lateral part of

[3] The single specimen reported from Germany in SCHELLER 1962 does not give any idea of its common occurrence. However, this is obvious from the continued studies of very rich collections from there, brought together during the years 1962—1967, recently worked through by the present author.

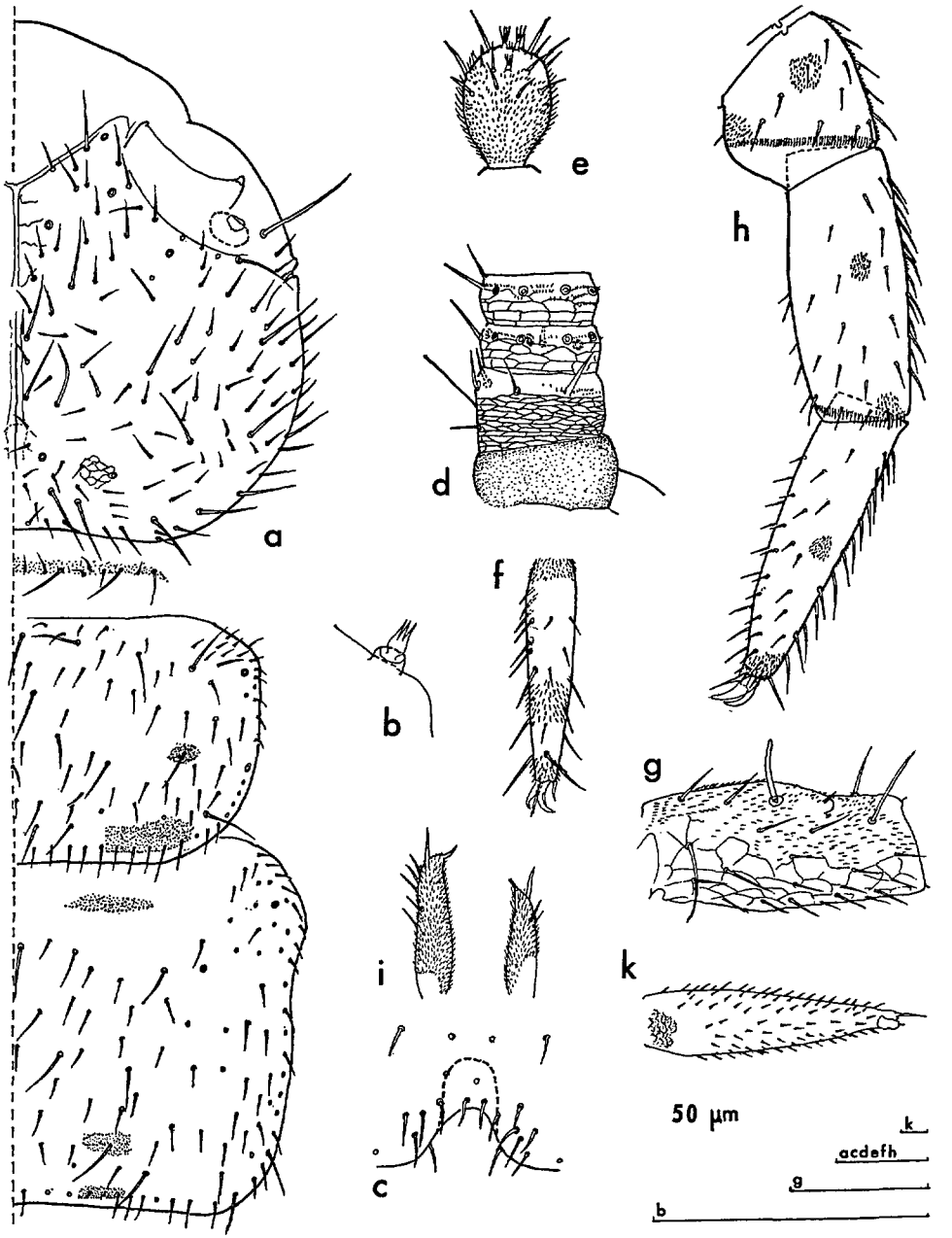

Fig. 1. — *Scutigerella echinostylus*, sp. n. — **a**, head and first 3 terga (setae of anterior part of head not drawn). — **b**, palp of left maxilla. — **c**, caudal cavity of 15th tergum. — **d** — **e** right antenna, from above: **d**, basal part; **e**, apical segment. — **f**, tarsus of first leg, from behind. — **g**, femur of first leg. — **h**, 12th leg, from in front. — **i**, styli: to the left of P 9, to the right of P 3. — **k**, left cercus, from inner side.

(4th-) 6th segment. Terminal segment 1.4 times longer than wide with at least 25 mostly anteriorly directed setae; prominent setae only slightly shorter than corresponding setae on proximal segments. There are 3 spined organs all of nearly equal lengths, two ones apically and one subapically; one of the former has a slightly longer stalk than the latter and arises from a small cuticular protuberance, its length being 0.2 of the length of the segment. Basal segments nearly glabrous: first one has only a few pubescence hairs inserted on a level with the outer dorsal primary seta; on the following segments the pubescence increases being complete on 7th—8th segments. Cuticle of first segment showing a very fine-scaly pattern contrary to the large-scaly pattern of 2nd and 3rd segments.

Terga. — First tergum rudimentary with 15 (—21) setae of very different lengths. Second tergum complete, rectangular, with its posterior margin straight (or nearly straight); it is (1.7—) 2.0 times broader than long and has c. 45 (—c. 50) marginal (or submarginal) setae. The longest ones of these setae inserted near the posterior corners and their lengths reaching twice (—4 times) the lengths of shortest marginal setae. Surface of tergum rather sparsely set with setae, the main part of them short, the rest of them distinctly longer, sometimes as long as the longest setae of the dorsal side of head. Cuticle with a dense, fine and short pubescence which partly form a squamose pattern. Third tergum much longer and a good deal broader than preceding one and with more pronounced postero-lateral corners. It is as broad as head and is 1.4 (—1.5) times broader than long; posterior margin straight (or feebly indented). Fourth tergum with its posterior margin feebly indented. Penultimate tergum with a pronounced postero-median emargination and slightly lanceolate marginal setae. Posterior median cavity of 15th tergum U-shaped, its covering having a broadly U-shaped posterior emargination.

Legs. — Tarsus of P 1 (4.3—) 4.4 times longer than wide and slowly tapering towards its distal end. Longest tergal row of setae comprising 5 setae the lengths of which increase strongly distally; the longest terminal seta is as long as the greatest diameter of the joint. This joint is densely pubescent. The femur has ventrally some setae prominently longer than the rest: 2 or 3 of them are thin and very pointed, the longest one being (0.5—) 0.6 of the greatest diameter of the joint, and one seta is long, thick, cylindrical, bluntended and located centrally. The latter seta is nearly 0.5 of the greatest diameter of the joint. The cuticular differentiations *x* and *y* are strongly reduced, especially the latter. The pubescence is lacking on the dorsal side of this joint, but the cuticle is there showing thickenings in form of a scaly pattern. Ventral side with a sparse pubescence which is distally partly very conspicuous. The claws have not been studied.

Tarsus of P 12 4.0 (—4.4) times longer than wide and rather strongly tapering towards distal end; tergal side straight, sternal side curved; tergal and sternal surfaces with 8 and 9 setae respectively in longest rows, the lengths of the setae slowly increasing distally. Tergal setae longer than sternal ones. Longest seta of this joint is the most distally located one of the tergal side, its length reaching 0.5 of the greatest

diameter of the joint. Tibia 2.3 times longer than wide, its length being (0.8—) 0.9 of the length of tarsus. Tergal side densely setose, longest tergal row having 6 (—7) setae, longest sternal one 3 (—4). Length of most distally located seta of dorsal side being nearly 0.3 (—0.4) of the greatest diameter of tibia. Several setae on posterior side, only a few on anterior side. Femur as long as wide with 5 setae in longest tergal row. Trochanter setose except on its tergal side and with some slightly lengthened setae on its sternal side. Anterior claw 1.3 times longer than posterior one and shorter than 0.2 of the length of tarsus. Pubescence of P 12 well developed except on (1—) 2 small spots of posterior side of tibia, on posterior side of femora and on tergal side of trochanter.

Styli slender and densely pubescent, most often provided with additional setae the number of which varies in different styli: those of P 3 have (1) 2 (left side) — 0 (right side), P 4 (1) 2 — (1) 3; P 5 2 — 0 (2); P 6 and P 7 2 (3); P 8 (2) 4; P 9 (3) 4—5; P 10 0 (2) — (0) 4; P 11 6 — (2) 4 and P 12 (2) 5 — (2) 3. The longer one of the two apical setae is straight and pointed, the shorter one slightly curved and bluntended.

There are 8 pairs of fully developed coxal sacs located at the bases of P 3 to P 10. Coxal plates of P 11 with 4—5 (6) setae and those of P 12 with 2—3 setae.

Cerci. — Cerci 3.8 (—4.0) times longer than wide; tergal side nearly straight and densely set with short setae. Longest tergal row with about 17—18 setae, all of the same length: somewhat more than 0.1 of the greatest depth of cercus. The outer one of the two apical setae longest: 0.4 of the greatest width of the cercus and 0.1 of the greatest length of the cercus. The shorter median one reaches 0.3 of the length of the longer outer one. The terminal area is shorter than 0.1 of the length of the cercus. Pubescence fine and dense, proximally arranged in a faint mesh pattern.

Affinities. — This new taxon belongs to the large group within *Scutigerella* distinguished by having the posterior margin of the second tergum subtruncate or broadly, shallowly emarginate. Among these species three ones have additional setae inserted on the styli in about the same manner as on *echinostylus: alpina* ROCHAIX, *seposita* SCHELLER and *silvatica* JUBERTHIE-JUPEAU. However, in contrast to *echinostylus* the styli of *alpina* are rather thick, shortened, those of *seposita* all lack additional setae anterior of the sixth pair of legs and those of *silvatica* are characterized by a lower number of additional setae. Moreover, there are several other characters separating *echinostylus* from these species, especially characters of the antennae, the palp of the first maxilla, the terga, the caudal cavity, the coxal sacs and the legs. Within the mentioned *Scutigerella* group there are also some species bearing more or less peglike projections of the femora of the first pair of legs: *lineatus* EDWARDS, *pagesi* JUBERTHIE-JUPEAU and *tusca* JUBERTHIE-JUPEAU. Though the projection with *lineatus* is similar to that with *echinostylus*, the two species are not identical, since the projections with the former occur only in the male and since there are several additional separating characters too e. g. on the anterior terga, the cerci and the styli. Concerning *pagesi* it must be noticed that its femora projections are of a quite different type and concerning *tusca* that the female there has

two projections on each femur. These two species are also separated from *echinostylus* by many other characters especially those of the styli.

Among the *Scutigerella* species having their second tergum deeply emarginate one species, *armata* HANSEN, also has peglike projections on the femora of the first pair of legs but any confusion with it is impossible since there are several separating features, not only concerning the different shape of the mentioned processi.

10. *Scutigerella linsleyi* MICHELBACHER, 1942

Italy. — Lago di Garda district, Mt. Baldo, near the place to alight the aerial rope-way to Bocca di Navene, scrub, 17. VI. 1964, 1 ad. (♀), (Loc. Ga-64/25; leg. Thaler).

Altogether 1 specimen: 1 ad. (♀).

This is a very rare species and is here reported for the first time from the European mainland. It is earlier known only from the type locality at Idyllwild in California and from Bishopsteignton in Devon, England (EDWARDS 1959). However, in a large symphylid material from southern Germany not yet published the present author has studied a few specimens of it.

11. *Scutigerella nodicercus* MICHELBACHER, 1942

Austria. — Vorarlberg, Rhätikon, south slope from Kangelscharte, grassy hillside, c. 2200 m a. s. l., 13. VII. 1961, 1 ad. (♀), (Loc. Ra-61/5; leg. Thaler). — Ibidem, at the road to Schesaplana, 2100—2400 m a. s. l., 14. VII. 1961, 1 ad. (♀), (Loc. Ra-61/6; leg. Hauser). — Ibidem, on the south slope of Kirchlispitze, 2340 m a. s. l., 16. VII. 1961, 1 ad. (♀), (Loc. Ra-61/14; leg. Thaler). — Ibidem, 17. VII. 1961, 4 ad. (3 ♂♂, 1 ♀), (Loc. Ra-61/17; leg. Hauser). — Ibidem, near the Seehöhle, grassy heath, under stones, 2300 m a. s. l., 17. VIII. 1964, 5 ad. (4 ♂♂, 1 ♀), (Loc. Vbg-64/2b; leg. Thaler). — Nord-Tirol, Kufstein district, Kaisertal, dense timber-forest of tall beeches, sparse bottom-vegetation, under stones, c. 900 m a. s. l., 9. VI. 1966, 1 ad. (♂), 1 juv. 10, (Loc. nT-66/7; leg. Thaler). — Nord-Tirol, E of the lake Achensee, Rofan, near the road Erfurter Hütte — Sonnwendjoch, under stones among scrubs and on a grassy heath, 1834—2100 m a. s. l., 2. VII. 1966, 4 ad. (♂♂), (Loc. nT-66/10; leg. Thaler). — Nord-Tirol, Innsbruck, 600 m a. s. l., 17. III. 1963, 1 ad. (♀), (Loc. T-63; leg. Schulze). — Nord-Tirol, Halltal, dense beech forest, under stones partly covered with beech leaf litter, c. 1100 m a. s. l., 12. VI. 1965, 2 ad. (♂, ♀). (Loc. nT-65/4; leg. Thaler). — Nord-Tirol, Oberperfuss-Kögerl, dense spruce forest, oftenmost on humid localities near a stream, under stones and pieces of bark, 1500—1650 m a. s. l., 20. VI. 1965, 4 ad. (2 ♂♂, 2 ♀♀), 2 juv. 10, (Loc. nT-65/6a; leg. Thaler). — Ibidem, 1650 m a. s. l., 20. VI. 1965, 2 ad. (♀♀), (Loc. nT- 65/6b; leg. Thaler). — Ibidem, 1300—1400 m a. s. l., 20. VI. 1965, 7 ad. (3 ♂♂, 3 ♀♀, 1 sex?), 2 juv. 11, (Loc. nT-65/7c; leg. Thaler). — Nord-Tirol, Kühtai, heath with grass and scrubs, under stones, c. 2050 m a. s. l., 25. V. 1964, 2 ad. (♀♀), (Loc. nT-64/2; leg. Thaler). — Nord-Tirol, Obergurgl, Gaisbergtal, 2500 m a. s. l., 7. VIII. 1959, 1 ad. (sex?), (Loc. Ob-59/20;

leg. Hauser). — Ibidem, c. 2400—2500 m a. s. l., 5. VIII. 1964, 4 ad. (♀♀), (Loc. Og-23a; leg. Thaler). — Nord-Tirol, Obergurgl, valley slope at Ort, c. 2000 m a. s. l., 16. IV. 1964, 2 ad. (♂♂), (leg. Thaler). — Nord-Tirol, Obergurgl, Rotmoostal, grass-heath, under stones, 2200 m a. s. l., 27. V. 1964, 5 ad. (2 ♂♂, 3 ♀♀), 1 juv. 11, (Loc. OG-64/16; leg. Thaler). — Nord-Tirol, Obergurgl, Zirbenwald-Schönwieshütte, near the tree-limit, scrubheath with dwarf pines, under stones, c. 2100 m a. s. l., 29. V. 1964, 2 ad. (♀♀), (Loc. OG-64/15; leg. Thaler). — Nord-Tirol, Obergurgl, Königstal bridge, at the mouth of Königstal brook, lushy herb-vegetation, under stones in a deep layer of förna, 1850 m a. s. l., 24. VII. 1964, 1 ad. (♀), (Loc. OG-64/21a; leg. Thaler). — Ibidem, Gschnitztal, between Trins and the Padasterjoch-Hütte, pasture below Burgwald, c. 1460 m a. s. l., 1. VII. 1967, 1 ad. (♂), (Loc. nT-67/6; leg. Hauser).– Ötztal Alps, S of the Rofan peak, 2160 m a. s. l., 6. VII. 1957, 3 ad. (1 ♀, 2 sex?), (Loc. 6.751; leg. Janetschek). — Salzburg, Tennengebirge, Hochkogel, 2280 m a. s. l., 1 ad. (sex?), (Loc. Te; leg. Janetschek).

Italy. — Zillertal Alps, SE of G. Mösele, Gamslahnernock, west slope, alpine grass-heath, 2500 m a. s. l., 1. VIII. 1963, 12 ad. (3 ♂♂, 8 ♀♀, 1 sex?), 2 stage?, (Loc. S/32; leg. Peskoller). — Ibidem, southwest slope, alpine grass-heath, 2430 m a. s. l., 3. VIII. 1963, 3 ad. (♀♀), (Loc. S/37; leg. Peskoller). — Ibidem, south slope, 2550 m a. s. l., 10. VIII. 1965, 36 ad. (13 ♂♂, 23 ♀♀), (Loc. S/105; leg. Peskoller). — Ibidem, Gamslahnernock, 2520 m a. s. l., 16. IX. 1963, 2 ad. (♂, ♀), (Loc. S/54; leg. Peskoller). — Ibidem, Gamslahnernock, 2450 m a. s. l., 27. VII. 1964, 3 ad. (♀♀) and 2420 m a. s. l., 27. VII. 1964, 1 ad. (sex?), (Loc. S/63 and S/64 resp.; leg. Peskoller).— Ibidem, Gamslahnernock, terrace at 2420 m a. s. l., 29. VIII. 1964, 5 ad. (♀♀), (Loc. S/68; leg. Peskoller). — Ibidem, Gögenalm, 2050 m a. s., 11. VIII. 1965, 2 ad. (♂, ♀), Loc. S/106; leg. Peskoller). — Ibidem, Nevesalm, scrub-heath, 2260 m a. s. l., 30. VII. 1964, 1 ad. (♂), (Loc. S/70, leg. Peskoller). — Ibidem, Nevesalm, in a valley, 1830 m a. s. l., 14. VIII. 1964, 1 ad. (♀), (Loc. S/75; leg. Peskoller). — Ibidem, Nevesalm, scrub-heath at the tree-limit, 14. VIII. 1964, 1 ad. (♀), (Loc. S/76; leg. Peskoller). — Ibidem, Chemnitzer Hütte, blocky slope, 2380 m a. s. l., 18. IX. 1964, 1 ad. (♀), (Loc. S/95; leg. Peskoller). — Ibidem, Schaflahnernock, south slope, 2600 m a. s. l., 8. VIII. 1965, 3 ad. (♂♂), (Loc. S/102; leg. Peskoller). — Ibidem, Tristenstein, northeast slope, grass-heath, 2400 m a. s. l., 31. VII. 1963, 1 ad. (♂), (Loc. S/30; leg. Peskoller). — Ibidem, 2717 m a. s. l., VIII. 1964, 2 ad, (♂♂), (Loc. S/77; leg. Peskoller). — Zillertal Alps, Speikboden, 2150 m a. s. l., 21. VIII. 1962, 1 juv. 11, (Loc. S 5/2; leg. Peskoller). — Ibidem, 2450 m a. s. l., 11. IX. 1962, 1 ad. (♀), (Loc. S_n; leg. Peskoller). — Ibidem, 2500 m a. s. l., 12. IX. 1962, 1 ad. (♀), (Loc. S_{12}; leg. Peskoller). — Bolzano district, between Schlern and Petz, stony grass-heath, 2461—2564 m a. s. l., 28. VII. 1966, 4 ad. (1 ♂, 3 ♀♀), 1 juv. 11, 1 stage?, (Loc. sT-66/3; leg. Thaler). — Ibidem, Schlern, below Cranzes, grass-heath, under stones on a doline-margin, c. 2400 m a. s. l., 28. VII. 1966, 1 ad. (♂), 1 juv. 11, (Loc. ST-66/4; leg. Thaler). — Valsugana valley, Borgo, Val Sella, high plateau between Cima Undici and Cima Dodici, karst formations, stony grass-heath, c. 2050 m a. s. l.,

25. IX. 1965, 4 ad. (3 ♂♂, 1 ♀), (Loc. OI-65/12; leg. Thaler). — Lago di Garda district, Mt. Baldo, the station of the aerial rope-way to Bocca di Navene, max. 1780 m a. s. l., 17. VI. 1964, 1 ad. (♀), (Loc. OI-64/9; leg. Hauser). — Udine, near a road, overgrown heaps of waste products, dense vegetation, c. 100 m a. s. l., 26. VII. 1965, 1 ad. (♀), (Loc. OI-65/2; leg. Thaler).

France. — Dauphiné Alps, below the Pilatte glacier, behind the 1850 terminal moraine, c. 2100 m a. s. l., 3—5. VIII. 1951, 2 ad. (sex?), (Loc. D-15/5 and D-15/5 S; leg. Janetschek). — Ibidem, just outside the 1850 terminal moraine on a hillock covered with dwarf scrubs, 2090 m a. s. l., 5. VIII. 1951, 3 ad. (1 ♂, 2 sex?), (Loc. D-15/6 Zl; leg. Janetschek). — Dauphiné Alps, near the Pilatte glacier, dwarf scrub heath, 2150 m a. s. l., 5. VIII. 1967, 2 ad. (sex?), (Loc. D-15/7; leg. Janetschek). — Ibidem, *Trifolium pallescens* — sociation, c. 2100 m a. s. l., 6. VIII. 1967, 3 ad. (sex?), (Loc. D-15/8 Z 2; leg. Janetschek).

Yugoslavia. Istria, Rovinj, San Giovanni, 5. VIII. 1965, 1 ad. (♀), (Loc. Ju-65/18; leg. Thaler). — Dubrovnik district, Srebreno, macchia, under stones, 24. IX. 1966, 1 ad. (♂), (Loc. Ju-66/2. leg. Hauser). — Ibidem, 4. X. 1966, 1 juv. 9, (Loc. Ju-66/3, leg. Hauser). — Ibidem, 5. X. 1966, 6 ad. (3 ♂♂, 3 ♀♀), 1 juv. 11, 1 juv. 10, 1 juv. 9, (Loc. Ju-66/6; leg. Hauser).

Altogether 170 specimens: 154 ad. (56 ♂♂, 82 ♀♀, 16 sex?), 13 juv., 3 stage?.

The high number of specimens and localities indicate that *S. nodicercus* is at least a widespread species and perhaps also an ubiquitous one. Within the investigated area this seems true but as its geographical distribution nor its ecological appearance is known outside the Alps it is now impossible to give the suppositions general validity. However, the species surely is one of the Scutigerellidae members most often met with in central Europe. GISIN (1951) says that it is occurring in the Austrian Alps and ATTEMS (1954) published a long list of localities. Only two more reports occur: one from Austria, the type locality at Salzburg (MICHELBACHER 1942), and the other from Germany, Kaiserstuhl (SCHELLER 1962). The French and Yugoslavian records are the first ones from these countries.

12. *Scutigerella remyi* JUBERTHIE-JUPEAU, 1963 b

Austria. — Vorarlberg, Rhätikon, between the Tilisuna-Hütte and the Seehöhle, grassheath, under stones, c. 2300—2500 m a. s. l., 16. VIII. 1964, 1 ad. (♂), (Loc. Vbg-64/1; leg. Thaler). — Ibidem, the main entrance of the Seehöhle, c. 2300 m a. s. l., 17. VIII. 1964, 1 ad. (♀), (Loc. Vbg-64/2a; leg Thaler). — Ibidem, in the neighbourhood of the Seehöhle, grassy heath, under stones, 17. VIII. 1964, 1 ad. (♂), (Loc. Vbg-64/2b; leg. Thaler). — Nord-Tirol, E of the lake Achensee, Rofan, at the road Bayreuther Hütte — Zireiner See, grass-heath, under stones between dwarf-like pines near a stream and melting snowpatches, c. 1700—1800 m a. s. l., 3. VII. 1966, 7 ad. (1 ♂, 5 ♀♀, 1 sex?), (Loc. nT-tt/13; leg. Thaler). — Nord-Tirol, Patscherkofel at Innsbruck, near the upper limit of the forest zone, 2050 m a. s. l., 26. VI. 1965, 4 ad. (♂♂), (Loc. I-65/16; leg. Seewald). — Nord-Tirol, Obergurgl, Rotmoostal, grass-

heath, under stones, 2200 m a. s. l., 27. V. 1964, 1 ad. (♂), (Loc. OG-64/16; leg. Thaler). — Ibidem, 27—28. VI. 1964, 4 ad. (1 ♂, 2 ♀♀, 1 sex?), (leg. Thaler). — Nord-Tirol, Obergurgl, Zirbenwald-Schönwieshütte, near the tree-limit, scrub-heath with dwarf pines, under stones, c. 2100 m a. s. l., 29. V. 1964, 1 ad. (♀), (Loc. OG-64/15; leg. Thaler). — Salzburg Alps, Untersberg, the Hollerloch cave, 1620 m a. s. l., 24. VII. 1965, 1 ad. (♂), (Loc. 1339/27; leg. Seewald).

Italy. — Zillertal Alps, SE of G. Mösele, Gamslahnernock, west slope, alpine grassheath, 2500 m a. s. l., 1. VIII. 1963, 4 ad. (3 ♀♀, 1 sex?), (Loc. S/32; leg. Peskoller). — Ibidem, 2520 m a. s. l., 14. IX. 1963, 1 ad. (♂), 1 juv. 11, (Loc. S/51; leg. Peskoller). — Ibidem, 2430 m a. s. l., 27. VII. 1964, 1 ad. (sex?), (Loc. S/62; leg. Peskoller). — Zillertal Alps, SE of G. Mösele, northern part of the Lappach valley, Nevesalm, 2260 m a. s. l., 14. VIII. 1964, 1 ad. (♂), (Loc. S/70; leg. Peskoller). — Zillertal Alps, SE of G. Mösele, Tristenstein, northeast slope, grassheath, 2400 m a. s. l., 31. VII. 1963, 1 ad. (♀), (Loc. S/30; leg. Peskoller). — Ibidem, 2717 m a. s. l., 15. VIII. 1964, 2 ad. (♀♀), 1 juv. 11, (Loc. S/77; leg. Peskoller). — Lago di Garda district, Bezzecca, Val Ledro, spruce forest near Lago d'Ampola, under stones, 725 m a. s. l., 14. VI. 1964, 1 ad. (♂), (Loc. Ga-64/11; leg. Thaler). — Lago di Garda district, Mt. Baldo, Bocca di Navene — Altissimo, dry broom-heath, under stones, c. 1430—1800 m a. s. l., 17. VI. 1964, 1 ad. (♀), (Loc. Ga-64/23; leg. Thaler).

Altogether 35 specimens: 33 ad. (13 ♂♂, 16 ♀♀, 4 sex?), 2 juv.

Perhaps this species is a pure central European one. The six type specimens of it were all collected in a forest between Hof and Donnerskirchen in the eastern Austria (JUBERTHIE-JUPEAU 1963 b) and the same author has mentioned it also from another Austrian locality, the Leitha Mountains in the easternmost part of the country (1963 a). Besides I have seen a few specimens from Kaiserstuhl and Schwarzwald in southern Germany. These records are the only ones known up to now.

In many specimens studied here the cover of the caudal cavity of the 15th tergum is much more indented than was stated in the type description. This character is an elastic one by *S. remyi* as it is by many other species of the genus.

13. *Scutigerella seposita* SCHELLER, 1966

Italy. — Valsugana valley, Borgo, 600—750 m a. s. l., 23. IX. 1965, 1 ad. (♀), (Loc. OI-65/6; leg. Thaler).

Altogether 1 specimen: 1 ad. (♀).

The above specimen is the only one known besides the single type described by the present author from Riva, St. Barbara, in northern Italy. As distinguished from the latter it has additional setae also on the styli ahead the sixth pair. Another slightly different character is the posteriorly rather shallow emargination at the center of the 15th tergum. By the type this is U-shaped.

14. *Scutigerella tusca* JUBERTHIE-JUPEAU, 1962

Italy. — Lago di Garda district, Bezzecca, Corno, 800—900 m a. s. l., 27. V. 1963, 1 ad. (♂), (Loc. Ga-63/10; leg. Thaler).

Altogether 1 specimen: 1 ad. (♂).

Only two earlier reports of this species occur within the symphylid literature: between Bibbiena and Pieve San Stefano near Firenze (JUBERTHIE-JUPEAU 1962) and Bibbiena (JUBERTHIE-JUPEAU 1963 a), both in Italy. The above specimen thus extends the distribution area northwards to the Alps.

The Bezzecca specimen agrees fairly well with the type male except in two respects. Firstly its styli bear one or two short additional setae, secondly it has a lower number of setae on the inner side of the tarsi of the last pair of legs. However, since the former character is most often a useful and reliable species separating character and since it was not at all discussed by JUBERTHIE-JUPEAU in her type description but is distinct here, there is some uncertainy about the identity.

Gen. *Hanseniella* BAGNALL

15. *Hanseniella nivea* (SCOPOLI, 1763)

Yugoslavia. — Dubrovnic district, Srebreno, macchia, under stones, 24, IX. 1966, 1 ad. (♀), (Loc. Ju-66/2; leg. Hauser). — Ibidem, 4. X. 1966, 2 ad. (♀♀), (Loc. Ju-66/3; leg. Hauser). — Ibidem, 5. X. 1966, 1 ad. (♂), (Loc. Ju-66/6; leg. Hauser).

Greece. — Korfu, macchia W of Kassiopi, 17. IV. 1960, 2 juv. 11, 4 juv. 8, (Loc. Ko-60/19 and Ko-60/20; leg. Hauser).

Altogether 10 specimens: 4 ad. (1 ♂, 3 ♀♀), 6 juv.

H. nivea is widespread in the middle and southern parts of Europe from Belgium-Austria-Hungary-Roumania in the north to the Pyrenees-Calabria-Crete in the south.

The Srebreno specimens as well as the ones from Korfu having eleven pairs of legs deviate from HANSEN's redescription of the species (HANSEN 1903) in having two distinct antero-lateral macrochaetae on the third (according to HANSEN's terminology second) tergum. They are nearly as long as those of the preceding tergum. Moreover, in the first mentioned specimens a pair of shorter postero-lateral macrochaetae occur on the terga 5, 8, 11 and 14.

Taxonomic Remarks

Among the Symphyla mentioned in this study one group, the genus *Scutigerella*, has a very confused taxonomy. The splitting of *S. immaculata* (NEWPORT) into 8 different species by MICHELBACHER (1942) and the subsequent description of 13 new species by several authors have strongly complicated identificational work within the genus. Moreover, the experience gained in this study shows that e. g. *nodicercus*, *palmonii* and *causeyae* have been erected without paying any regard to the high variability often occurring. In this way some of the characteristics adopted by MICHELBACHER are partly very doubtful and partly very vague and lying beyond the definitive and narrow bounds of an objective identification.

Zoogeographical Notes

Since the records of the above list mainly come from occasional finds their reliability in zoogeographical discussions is highly limited. Thus the low number of Scolopendrellidae localities do not picture their true distribution. Though only a few mountainous localities have been reported here of this family, most of the actual species, in that case including *Symphylella isabellae* (GRASSI) not found in these collections, must be rather common in alpine as well as lowland districts of the countries involved in this study. Their smallness and slowness make them much more difficult to discover than the Scutigerellidae representatives.

Looking at the different collections the Austrian material comprises 7 different species. Most of them have not been reported earlier from this country: *Scolopendrellopsis subnuda*, *Symphylella elongata* and *major* and also *Scutigerella causeyae*. Since by earlier authors *Scolopendrella notacantha*, *Symphylella vulgaris*, *Scutigerella immaculata*, *S. nodicercus*, *S. remyi* and *Hanseniella nivea* have been reported, the Austrian symphylid fauna seems to comprise at least 10[4] species.

The author has found nearly the same number of species (7) in the Italian collections, but all of them belong to Scutigerellidae. Three of these have not been announced earlier from here: *Scutigerella echinostylus*, *linsleyi* and *remyi*. Comparing the Austrian and Italian mountainous Scutigerellidae fauna it seems that the latter indubitably has a larger number of species (7) than the former (5). Summing up the above records and those reported earlier by several authors (see ROCHAIX 1955, JUBERTHIE-JUPEAU 1962 and 1963 a and SCHELLER 1966) the Italian symphylid fauna seems to comprise at least 16 different species in total.

Among 3 species reported here from Yugoslavia, *Scolopendrellopsis microcolpa*, *Symphylella vulgaris* and *Scutigerella nodicercus*, only the latter is new to that country. Earlier Yugoslavian finds include 3 more species: *Symphylella isabellae* (GRASSI), *Scolopendrellopsis balcanica* REMY and *Hanseniella nivea* (SCOPOLI), all according to REMY (1943)[5].

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[4] The record by HANSEN (1903) from Razzes in Tyrol was of course *immaculata* in the sense of NEWPORT, since the splitting of the species carried out by MICHELBACHER was not published until 1942. From the studies above it appears rather improbable to me that *immaculata* sensu MICHELBACHER is occurring in Austria though ATTEMS (1954) reported a single specimen from Leichenberg near Admont.

The material of *immaculata* (NEWPORT) reported from the Innsbruck district by FRIEDEL (1928) also seems to be made up of species other than *immaculata* MICHELBACHER. FRIEDEL's large autecological study "Ökologische und physiologische Untersuchungen an *Scutigerella immaculata* (NEWP.)" was surely based on a very heterogeneous collection. From the author's study it seems reasonable to assume that the main part of his material belonged to *nodicercus* and, but to a lower degree, to *remyi* and *causeyae*.

The dubious notice in MICHELBACHER 1942 that *Scutigerella verhoeffi* MICHELBACHER has been found "probably from the Austrian Alps in Southern Germany" (p. 280) has been omitted.

[5] In the same paper REMY also mentioned *Scutigerella immaculata* from Yugoslavia, but he had not taken into consideration the splitting of the species carried out by MICHELBACHER.

From France 10 species have been announced up to now including several records of *Scutigerella immaculata* in the sense of NEWPORT. To these species we can now add *Scutigerella nodicercus*.

New Records of Symphyla from Central and Southern Europe Ulf SCHELLER

Zusammenfassung:

Der Autor hat Symphylen-Material aus Frankreich, Griechenland, Italien, Österreich, der Schweiz und Jugoslawien in taxonomischer und zoogeographischer Hinsicht untersucht. Von 294 Individuen, die sich auf 15 Arten verteilen und vor allem aus Italien und Österreich stammen, werden Fundort und Habitat angegeben. Fünf Arten sind neu für Österreich, vier für Italien, eine für Frankreich und eine für Jugoslawien. Die Verbreitung der Arten wird diskutiert. In mehreren Fällen werden taxonomische Details erörtert, vor allem bei den *Scutigerella*-Arten.

Scutigerella echinostylis wird als neue Art beschrieben, ihre systematische Stellung wird diskutiert.

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