Annotated list of sawflies (Hymn. Symphyta) from Kanton Unterwalden Central Switzerland. Part I

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ANNOTATED LIST OF SAWFLIES (HYM., SYMPHYTA) FROM KANTON UNTERWALDEN CENTRAL SWITZERLAND

Part I

A.D. Liston

Introduction

The first faunal list on Swiss sawflies was that of DIETRICH (1868). This lists 78 species found in Kanton Zürich, with 6 described as new to science (none of which is recognised as valid by modern workers). STECK (1893) compiled a substantial paper which listed records of 396 species from various parts of Switzerland. His work was the first, and last, to deal with Switzerland as a whole, and it remains the major source of reference for the families containing the larger and more distinctive species: the section on Nematinae (of the Tenthredinidae) is inadequate however. The only other major contributions were those of BENSON, who dealt mainly with the alpine Nematinae of Wallis (1955a, 1960) and Graubünden (1961).

Additional records for some species may be found in the monographs of ENSLIN (1912-17) and KONOW (1901-05, 1902). The following papers deal with small numbers of species found in Switzerland: BENSON (1938, 1947, 1950a, 1954, 1955b, 1960a, 1963, 1965a), NAEGELI (1931, 1936), STAEGER (1919) and WULLSCHLEGEL (1863). PETER (1979) and REZBANYAI (1974) give records of Swiss sawflies found at lights and light-traps.

BEAUMONT (1947), writing before BENSON published his work on Swiss sawflies, estimated that 450 species of Symphyta had been recorded from Switzerland and that this numer would rise to 600. PETER (1979) thought that 490 had been discovered. My own calculations lead me to think that about 550 species are known, but this will certainly rise.

Only two or three old records of sawflies exist for Unterwalden, and many other potentially rich cantons remain completely unexplored for sawflies. The cantons surrounding Unterwalden (Luzern, Schwyz, Uri) are similarly virtually unknown. The present list, despite its numerous shortcomings, may help towards filling this large gap in our knowledge of sawfly distributions in Europe.

Identification

The following major works were used in the identification of specimens: BENSON (1951-58), BERLAND (1947), ENSLIN (loc.cit.), GUSSAKOWSKIJ (1935-47), KONOW (l.c.) and MUCHE (1967-70, 1974). References to several other papers dealing with single genera or species groups are given beside the relevant generic or group heading. LORENZ and KRAUS (1957) were consulted for information on larvae.

Kanton Unterwalden

This small rural canton lies at the heart of Switzerland, on the northern edge of the Alps. It is divided into the two half-cantons of Obwalden (190 square miles) and Nidwalden (106 square miles). These are abbreviated to

NW and OW in the following list. The division is useful since it is largely natural; Obwalden contains the major mountain areas and is less accessible than the low valleys of Nidwalden. The lowest land is found around the Lake of Lucerne, NW (about 450 m a.s.l.), the highest near Engelberg, OW (summit of Mt. Titlis, 3239 m). The rock is limestone throughout. The tree line is reached at about 1800 m, but it is very broken in most places. An interesting history and description of the area is given by BUSINGER (1836).

Collecting

Though the area is faunistically and botanically rich, for a number of reasons I did not manage to push the number of sawflies found very far over a hundred. The principal reason for this lay in the fact that all collecting was done in July, and with the exception of alpine localities, most of the adult Nematinae had disappeared. The effect of this was offset, however, by the different stages of advance reached by the season during the three years of collection (1977-79). Secondly, Betula, one of the most productive plants from which these insects can be collected, is very scarce in this part of Switzerland. I did not experience the same effect of ants on the immature stages of sawflies feeding on Salix as did BENSON (1950b).

Localities

The place names given in the list may be found on the map "Touristenkarte vom Vierwaldstättersee" published by the Schiffahrtsgesellschaft des Vierwaldstättersees, Luzern.

Little needs to be said about the "lowland" and subalpine localities. These are exclusively meadowland and light coniferous forest habitats. Until two or three years ago the nature reserve at Herrenrüti, near Engelberg, was without a doubt by far the richest locality for insects in the canton, but unfortunately the local farmers appear to have gained permission to cut the area for hay. The resultant loss of insects, and the disappearance of scores of plants, have reduced the interest of the locality to that of the surrounding meadows.

The differing qualities of the alpine habitats collected in during the course of this survey are worthy of discussion. At the Trübsee (1800 m) snow was still lying over much of the ground during early July 1979, and spring insects, such as alpine Pristiphora ssp. were flying. At the same time on the Haldigrat (2000 m), only summer insects, such as Tenthredo species, were present, the snow had gone, and the grass was brown and dry. On Mt.Pilatus, at a subalpine locality (Alp- Gschwänd, 1300 m) conditions were in the late spring phase, with both Tenthredo ssp. and Nematinae occurring. The reasons for these differences are probably compound: the aspect of the area, drainage, topography of the surrounding land and similar factors probably all play a part. Both Trüebsee and Alp-Gschwänd are north-facing, whilst I collected on the south side of the Haldigrat. The Haldigrat, at its name implies, is a very exposed and fairly narrow ridge, and is not dominated by any higher ground. It therefore drains quite quickly after any rain. The Trüebsee lies in the bowl of a large corrie and the drainage and meltwater from the snowfields on the surrounding mountains therefore flow down to it. The slopes where I collected at Alp-Gschwänd are dominated by the peaks of Pilatus, a mountain which always seems to attract cloud and rain. Further,

due to its aspect, Haldigrat probably has longer hours of sunshine than other localities. In conclusion, therefore, it must be said that neither exposure nor altitude can be taken as reliable indicators of the sawflies occuring at any particular locality in the early summer.

A rough altitudinal classification of the collecting localities now follows. Lowland (450-1100 m): Niederrickenbach, Oberrickenbach, Stans, Wolfenschiessen, Dallenwil, Dörfli, Hergiswil am See, Brunni, Hüsli/Seeblick, Wiesenberg, Grafenort-St. Joder, Beckenried, Kernalpbach, Diegisbalm, Lielibach. Subalpine (1200-1700 m): Alpboden, Fräkmuntegg, Alp-Gschwänd, Rinderbühl-Stockhütte, Wandeli, Wirzweli, Herrenrüti, Ende der Welt, Firnalpeli. Alpine (1700 m +): Haldigrat-Brisen, Trüebsee.

The list

A few species recorded from Unterwalden in other works, but not found by the present writer, are enclosed in square brackets. Altitudes are all in metres. Cantonal and place names are germanicised for uniformity. World distribution data, larval host plants and months of adult occurrence are only given where the species is not treated in BENSON (1951-58), or is of particular interest.

The numbers of specimens captured at each locality can not always be relied upon to produce a true impression of the species' abundance. This is because single specimens of a species may have been found outside that insect's normal flight season: the species may actually be quite common earlier, or later, in the year.

PAMPHILIIDAE

Cephalcia Panzer (European species revised by BENEŠ, 1976)

C. arvensis Panzer (= adusta Dietrich)
1 ♀, Fräkmuntegg, NW, 5.vii.79. 2 ♂, Ende der Welt, OW, 15.vii.79
Swarms of ? males observed around tops of spruces at Alpboden, NW, 11.vii.79.

Probably distributed throughout Switzerland, but commonest at subalpine levels. Recorded from Graubünden (BENSON, 1961), Zürich (DIETRICH, l.c.), Bern (STECK, l.c.). Throughout Europe and Siberia. Larva solitary in a silken tube in the needles of Picea. A forestry pest (detailed biological information is given by ESCHERICH, 1940, and VERZHUTSKII, 1966). Easily confused with C. lariciphila (Wachtl), but arvensis can be readily distinguished by its much paler femora. Flies from IV-VI.

Pamphilius Latreille

P. aurantiacus (Giraud)

Leaf-rolls, with larvae, and 1 ♀, above Hergiswil, NW, 14.vi.78 (on Acer platanoides L.). Larva described by LORENZ & KRAUS (l.c.). On A. campestre L. and platanoides. Known from Germany (I have found it in Baden-Württemberg: Heidelberg, Bad -Rotenfels and Karlsruhe), Transcaucasia (BENSON, 1968), Italy, Austria, Hungary, France and Romania. Not previously recorded in Switzerland. Flies from V-VII.

P. hortorum ssp. hortorum (Klug)

1 ♀ , taken in flight, Beckenried, NW, 7.vii.77. Recorded from Bern and Basel (STECK), l.c.)

P. vafer (L.)

1 ♀ , and very many leaf-rolls on Alnus glutinosa (L.) Gaertn. growing beside the Engelberger Aa at Herrenrüti, OW, 5.vii.79. Recorded from Graubünden (BENSON, 1961). This species occurs in Southern Europe (Yugoslavia and Albania), as well as in the North.

P. marginatus (Lepeletier)

2 ♀ , Niederrickenbach, NW, 6.vii.79. Swept from Corylus avellana L. Recorded from Glarus (STECK, l.c.). Larva in a leaf-roll on C. avellana or Carpinus betulus L. Biology described by LORENZ & KRAUS (l.c.) and STRITT (1937). Central and Southern Europe. Flies V-VI.

ARGIDAE

Arge Schranke

A. ustulata (L.)

2 ♀ , at light in Hotel Pilatus, Hergiswil, NW, 10.vii.77. Sawflies are frequently recorded at light traps (PETER, l.c: REZBANYAI, l.c: STRITT, 1971). The exact significance of these records is not known, but some species certainly do show crepuscular, if not nocturnal, flight activity. Argidae are not especially recorded: STRITT (l.c.) records only A. berberidis Schrank and Sterictiphora geminata (Gmelin). A. ustulata has previously been recorded from Wallis, Aargau, Neukastel, Tessin, Bern (STECK, l.c.), Graubünden (BENSON, 1961), and Zürich (DIETRICH, l.c.).

CIMBICIDAE

Albia Leach

A. candens Konow

2 ♀ , Herrenrüti, OB, 11.vii.77. 1 ♀ , same locality, 5.vii.79. The rather sedentary adults of Abia spp. are often found on Scabiosa (CHAMBERS, 1947). The first two specimens noted above were found on flowers of Scabiosa columbaria L. (as were the specimens of A. sericea (L.) found by CHAMBERS). The third specimen was taken from an inflorescence of Ligusticum mutellina (L.) Crantz (Umbelliferae), and possibly it had visited this because of a lack of Scabiosa flowers that was evident at this locality. Recorded from the Beatenberg, Kanton Bern by STECK, l.c. Possibly confined to subalpine areas of Switzerland.

A. sericea (L.)

1 ♀ , Dörfli, NW, 12.7.78. On inflorescence of Succisa pratensis Moench. More widely distributed in Switzerland than candens and recorded from Zürich (DIETRICH, l.c.), and according to STECK (l.c.), the commonest cimbicid species in Switzerland, not uncommon throughout the Swiss Plain and the foothills of the Alps. He gives Zaraea fasciata (L.) as a species with a similar distribution.

Cimbex Olivier

C. luteus (L.)

A few larvae of this species were beaten from bushes of Salix alba L. growing beside the Aa et Dallenwil. An empty cocoon was also found at the base of a trunk, amongst dead grass, slightly further up the river. Both localities are in Nidwalden: specimens were collected on several occasions in 1977 and 1978. Recorded from Bern (STECK, l.c.).

TENTHREDINIDAE

Selandriinae

Heptamelus Haliday

H. ochroleucus (Stephens)

2 larvae removed from stems of an unidentified Pteridophyte, in coniferous forest near Alp-Gschwänd, NW, 14.7.77. 1 ♀, swept from grass, on lower slopes of The Schwalmis (1300 m), near Wandeli, 15.vii.79. I do not know of any previous records of this species from Switzerland.

Strombocerus Konow

S. delicatulus (Fallén) (= Synairema alpina Bremi)

6 ♀, 9 ♂, Trüebsee, NW, 11.vii.78. 2 ♀, 1 ♂, Fräkmuntegg, NW, 10.vii. 79. 1 ♀, Wandeli, NW, 15.vii.79. This species was present in prodigious numbers around ferns growing on solifluction slopes below the Jochpass (1900 m), near Trüebsee. Commonest at subalpine and alpine levels in Switzerland. One gets the impression that the species may be unusually local in Switzerland: it has only been recorded by BREMI (1849), as Synairema alpina sp.n.

Neoselandria Rohwer

N. morio (F.)

3 ♀, Altzellen-St.Joder, NW, resting on Populus tremula L. 16.vii.79. Previously recorded from Graubünden (BENSON, 1961), and according to STECK (l.c.), "Generally common, and yet, I have seen no specimens from the mountain areas". Some modern works give two foodplants for this species, but Myosotis palustris (L.) Hill is simply a synonym of M. scorpioides L.

Birka Malaise

B. cinereipes (Klug)

5 ♀, 1 ♂, Kernalpbach, NW, 7.vii.79. 2 ♀, Niederrickenbach, NW, 12.vii. 78. 3 ♀, Oberrickenbach, NW, 17.vii.78. 1 ♀, Brunni, NW, 8.vii.78. 19 ♀, 25 ♂, Wiesenberg, NW, resting in sun on whitewashed wall of church. 15.vii. 78. 1 ♀, Rinderbühl-Stockhutte, NW, 15.vii.79. 7 ♀, 9 ♂, Herrenrüti, OW, 11.vii.77. 5 ♀, Ende der Welt, OW, 15.vii.79. One of the most abundant sawflies in the area. Specimens were found on a wide range of herbaceous plants, shrubs and trees. Recorded from Bern, Zürich, Glarus and Basel (STECK, l.c.).

Selandria Leach

S. serva (F.)

5 ♀, 7 ♂, in meadows along the course of the Engelberger Aa between Dallenwil and Wolfenschiessen, NW, 9.vii.77. Previously recorded from Bern and Zürich (STECK, l.c.)

Dolerus Panzer

D. aericeps Thomson

1 ♀, Niederrickenbach, NW, 6.vii.79. 3 ♂, Oberrickenbach, below Eggeli, NW, 7.vii.79. 5 ♀, 11 ♂, and larvae on Equisetum sp., Lielibachtal, NW, 8.vii.78. Previously recorded from Graubünden (BENSON, 1961), Tessin, Schwyz, Bern, Uri and St. Gallen (STECK, l.c.)

D. aeneus Hartig

6 ♀, 10 ♂, Haldigrat, NW, 11.vii.79. 2 ♂, Trüebsee, NW, 11.vii.78. 6 ♀, Ende der Welt, OW, 15.vii.79. 44 ♀, 11 ♂, Diegisbalm, NW, 7.vii. 79. 16 ♀, 26 ♂, Fräkmuntegg, NW, 8.vii.77. 1 ♀, Alp-Gschwänd, NW, 8.vii.78. Probably very common throughout Switzerland. Frequent in the lowlands, but occurring in even greater numbers at alpine and subalpine levels. Specimens are recorded from up to 2680 m in Graubünden (BENSON, 1961). STECK (l.c.) records the species from Bern, Aargau, Wallis and Uri.

D. coracinus Klug

1 ♀, Haldigrat, NW, 11.vii.79. Previously recorded from Bern and Schaffhausen (STECK, l.c.).

D. ? nitens Zaddach (= wanda Ross)

7 ♀, 5 ♀, 1 ♀, Trüebsee, NW. On 11, 11, 10, vii. of 77, 78, 79 respectively. All swept from Carex ssp. This insect was first noted by BENSON (1961) as a parthenogenetic subalpine and alpine race of nitens differing from the typical boreal form in being non-metallic. The race also occurs in the North American States of New York, Ohio and Illinois, where it was found and describend as Dolerus wanda by ROSS. There is some doubt as to wheter the insect was introduced to America or whether it is native there. BENSON (1962a) considered that the Alpine Swiss and the American form might possibly represent a distinct species and that the name wanda would be available for this. Recorded from Graubünden (BENSON, 1961). Typical nitens recorded from Kanton Zürich (STECK, l.c.).

D. liogaster Thomson

2 ♀, black legged form, Diegisbalm, NW, 7.vii.79. Previously recorded from Zürich, Bern, Wallis (STECK, l.c.) and Graubünden (BENSON, 1961).

Blennocampinae

Athalia Leach (Revision of world species by BENSON, 1962b)

A. rosae (L.)

3 ♀, Dörfli, NW, 12.vii.79. 1 ♀, Hergiswil, NW, 13.vii.77. 1 ♀, Ende der Welt, OW, 15.vii.77. All specimens taken from inflorescences of Um-

belliferae. Probably quite common in the meadows of the lower valleys: the specimens from Obwalden, taken at 1200 m, was probably a vagrant. Recorded from Graubünden (BENSON, 1961), Zürich (DIETRICH, l.c.), Bern, Aargau and Wallis (STECK, l.c.). Its known foodplant range covers a wide variety of Cruciferae: Armoracia rusticana Gaertn., Mey. & Scherb., Barbarea ssp., Brassica napa L., B.nigra (L.) Koch, B.juncea L. and B.rapa L., Raphanus raphanistrum L., Rorippa amphibia (L.) Bess., Sinapis alba L. and S.arvensis L.

A.circularis (Klug)

5 ♀, 2 ♂, Hüsli, NW, 16.vii.78. 5 ♀, 3 ♂, Wiesenberg, NW, 15.vii.78. 1 ♀, 1 ♂, Niederrickenbach/NW, 12.vii.78. 3 ♀, Dörfli, NW, 6.vii.79. 3 ♀, Oberrickenbach, NW, 17.vii.78. 7 ♂, Firnalpeli, OW, 5.vii.79. The commonest and most widely distributed species of the genus in the area. Larva recorded from Arctium lappa L. and Capsella ssp. as well as the plants listed in BENSON (1951-58, p.83). Recorded from Graubünden (BENSON, 1961). In BENSON's "Revision of the Athaliini" the synonymy for this species includes A.bolivari Dusmet, A.cordatoides Kontuniemi and A.longifoliae Kont.: in my opinion this synonymy is correct. The recognition of bolivari as a distinc species in the latest KLOET & HINCKS Checklist (Handbks. Ident. Br. Insects, 11, pt.4. 1978) does, I think, result from a misprint (Most certainly the placement of Pachynematus scutellatus, P.smithae and P.sulcatus under synonymy for P.rumicis has resulted from a similar unfortunate printing error, but in the latter case each of the four species is so distinctive that little confusion is likely to arise).

A.glabricollis Thomson

2 ♀, Wirzweli, NW, 12.vii.78. To the larval foodplants given in BENSON (1951-58, p.81) should be added Diplotaxis tenuifolia (L.) D.C. Previously recorded from Graubünden (BENSON, 1961); STECK (l.c.) says "Common throughout, May to September".

A.liberta (Klug)

1 ♀, Fräkmuntegg, NW, 8.vii.78. Foodplants not noted in BENSON (1951-58, p.83) include Alliaria officinalis Bieb., Arabidopsis thaliana (L.) Heynh., Sinapis alba L. and S.arvensis L. Previously recorded from Bern, Zürich and Wallis (STECK, l.c.).

A.paradoxa Konow

1 ♀, Ende der Welt, OW, 15.vii.79. Scarce species of the Central and Southern European (France, Switzerland, Austria and Southern Yugoslavia). MUCHE (1967-70, p.129) says that the larva feeds on Crassulaceae and Cruciferae, but I have been unable to trace the origin of his records. Previously recorded from Uri (STECK, l.c.). Flies VI-VII.

A.cornubiae Benson

3 ♀, from beside overgrown field wall at Beckenried, NW, 7.vii.77. Scarce, or perhaps simply local, parthenogenetic species. Larva apparently monophagous on Sedum album L. (GRADWELL, 1957). Previously recorded from Graubünden (BENSON, 1961).

A. cordata Lepeletier

3 ♀ , 1 ♂ , Brunni, NW, 8.vii.77. 1 ♂ , Lielibach, NW, 8.vii.78. Recorded by STECK (l.c.) as "Generally common", recorded by BENSON (1961) from Graubünden.

Empria Lepeletier (Incomplete, bute useful, keys by DOVNAR-ZAPOLSKIJ, 1929, and CONDÉ, 1940).

E. longicornis (Thomson)

2 ♀ , Hergiswil, NW, swept from Rubus caesius L. 11.vii.78. Recorded from Bern, Wallis (STECK, l.c.), Graubünden (BENSON, 1961).

Ametastegia A. Costa

A. glabrata (Fallén)

1 ♂ , Wirzweli, NW, 16.vii.77. Highly polyphagous (LORENZ & KRAUS, l.c.). Recorded from Zürich (STECK, l.c.).

Protoemphytus Rohwer

P. carpini (Hartig)

1 ♀ , Herrenrüti, OW, 11.vii.77. 2 ♂ , Trüebsee, NW, 11.vii.78. Recorded from Zürich, Basel (STECK, l.c.), Wallis (BENSON, 1955a), and Graubünden (BENSON, 1961).

Allantus Panzer

A. rufocinctus (Retzius)

1 ♂ , on Pilatus, above Fräkmuntegg, NW, 16.vii.78. Swept from Rosa sp. Recorded from Bern, Wallis (STECK, l.c.), and Graubünden (BENSON, 1961).

A. viennensis (Schrank)

1 ♂ , Alp-Gschwänd, NW, 8.vii.78. With the above noted specimen. Larva on Rosa. Presence in Switzerland first noted by KONOW (1885), but I do not know of any subsequent records. Central and Southern Europe, and Transcaucasia (BENSON, 1968). VI-VIII.

A. melanarius (Klug)

1 ♀, Oberrickenbach, NW, 17.vii.78. Resting on vegetation next to a solitary bush of Cornus sanguinea L. growing in a very shady glade in coniferous forest. Attempts to obtain more specimens from Dogwood growing at Dallenwil were not successful. Recorded from most of Europe, but not apparently from Switzerland.

Caliroa O. Costa

C. cerasi (L.)

6 ♀ , from various plants, Hergiswil, NW, 10.vii.78 and 14.vii.79. Orchards of apple, pear or cherry occur on almost every suitable lower hillside in this area and it is most likely that this species is commonest on these trees. Recorded from Wallis and Basel (STECK. l.c.).

Eutomostethus Enslin

E. gagathinus (Klug)

1 ♂ , Niederrickenbach, NW, 12.vii.78. Recorded from Bern, Zürich, Glarus and Schwyz (STECK, l.c.)

Hypargyricus MacGillivray

H. nodicornis (Konow)

1 ♀ , Firnalpeli, OW, 5.vii.79. Central European Alps, Bulgaria and Siberia. Larva on Veratrum album L. Previously recorded from Graubünden (BENSON, 1961), and Wallis (BENSON , 1955a). V-VII.

Blennocampa Hartig

B. pusilla (Klug)

Characteristic leaf-rolls of this species found at Brunni, NW, 5.vii.79 and at Herrenrüti, OW. Same date. Both on Rosa spp. Recorded from Bern and Zürich (STECK, l.c.).

Monophadnoides Ashmead

M. geniculatus (Hartig)

2 ♀ , Trüebsee, NW, 10.vii.79. 1 ♀ , Haldigrat, NW, 11.vii.79. Trüebsee specimens were found visiting flowers of a Globularia sp. (? cordifolia L.) and eating the small Diptera which were also at the blooms. The specimen from Haldigrat was found on a flower of Dryas octopetala L. Recorded from Zürich (STECK, l.c.).

Claremontia Rohwer

C. confura (Konow)

1 ♀ , Trüebsee, NW, 10.vii.79. Previously recorded from Bern (STECK, l.c.).

C. tenuicornis (Klug)

3 ♀ , 4 ♂ , Fräkmuntegg, NW, 16.vii.77. Swept from a steep slope carpeted with Alchemilla alpina L. Recorded from Wallis (BENSON, 1955a), Graubünden (BENSON, 1961) and Zürich (STECK, l.c.)

C. waldheimii (Gimmerthal)

1 ♀ , and larvae on Geum rivale L., Herrenrüti, OW, 11.vii.77. Recorded from Wallis (BENSON, 1955a), Graubünden and Zürich (STECK, l.c.).

Tenthredininae

[Aglaostigma fulvipes (Scopoli)

"Engelberg (FRIESE)" STECK (l.c.) Also from Graubünden (BENSON, 1861), Zürich, Wallis and Bern (STECK, l.c.).]

Tenthredopsis A.Costa

T. nassata (L.)

3 ♂ , Trüebsee, NW, 11.vii.78. 2 ♀ , 1 ♂ , Niederrickenbach, NW, 12.vii.78. 5 ♀ , 1 ♂ , Rinderbühl-Stockhutte, NW, 15.vii.79. The name nassata is used here in the broad sense in which it was used by BENSON (1951-58).

WEIFFENBACH (1968) found genitalic differences correlated with colour pattern amongst Tenthredopsis which led him to maintain a few of the species which BENSON synonymised with nassata (austriaca Konow, inornata Cameron and scutellaris Fabricius, for example). Some of WEIFFENBACH's comments are clearly correct (T. austriaca, a Mediterranean species, for instance, belongs to a completely different group of species from nassata, and is probably a close relative of T. annuligera (Tischbein), but since the genitalia of sawflies are known to vary infraspecifically in several species an species-groups, the slight differences depicted in his drawings of saws and penis valves may not be of taxonomic importance.

Further, one has to remember that the female's ovipositor is liable to wear and mechanical damage which may completely alter the shape of its marginal teeth (BENSON, 1963). His paper therefore does little to resolve the overwhelming problems and confusion surrounding the taxonomy of this genus: for the present, BENSON's policy of "lumping" is probably the best approach to adopt. A key to world species groups and a large number of species was given by BENSON (1968).

T. nassata has been found throughout Switzerland.

T. sordida (Klug)

2 ♀ , Ende der Welt. OW, 15.vii.79. Central European species (France, Switzerland, Northern Italy, Austria and Germany). Larva on Lolium perenne L. RUDOW (in ENSLIN, 1912-17) records the larva of this species from Carpinus betulus L., but his determination of adult sawflies are notoriously inaccurate and the insect concerned probably belongs to a completely different genus. STECK (l.c.) says of sordida "A widely distributed species" and gives localities in Bern, Zürich and Wallis.

T. litterata (Geoffroy)

1 ♂ , Niederrickenbach, NW, 7.vii.77. 1 ♀ , Husli, NW, 14.vii.78. 3 ♀ , Grafenort-St.Joder, NW, 16.vii.79. STECK (l.c.) records this species (as thomsoni Konow) from Basel, Aargau, Zürich, Bern and Solothurn.

Rhogogaster Konow (World species keyed by BENSON, 1965b).

R. picta (Klug)

1 ♀ , Diegisbalm, NW, 7.vii.79. Larva on Genista germanica L., G. tinctoria L., Lembotropis nigricans (L.) Griseb. and Cytisus scoparius (L.) LINK (though the last of these is not present in Unterwalden). Now known from most European countries. STECK (l.c.) gives several Swiss records for picta, but some of these could refer to the two allied species not distinguished by collectors at that time (R. genistae Benson has not yet been recorded from Switzerland, though chambersi Benson has).

R. chlorosoma (Benson)

7 ♀ , 8 ♂ , Fräkmuntegg, NW. Various dates. 2 ♀ , Alpgschwänd, NW, 16.vii.78. 3 ♀ , 1 ♂ , Haldigrat, NW, 11.vii.79. Adults predatory and were observed resting on various prominent pieces of vegetation whiles waiting

for slow-flying insects, always smaller than themselves, to pass near them (Dolerus aeneus often fell victim to attack by this species). After catching a suitable insect, the Rhogogaster drops to the ground with it and proceeds to devour it. If the prey should be a D. aeneus, the head and prothorax are removed first and discarded, the wings are sometimes then torn off, though this may depend on how much resistance the insect is giving, and the contents of the thorax are consumed. On two of the three times I have observed R. chlorosoma eating D. aeneus (all the Rhogogaster were females: the Dolerus were a male and two females) the remains of the prey were discarded with the abdomen intact. On the third occasion the anterior half of the abdomen was torn open and some of the internal matter eaten. This species is not a regular flower visitor: I have twice seen specimens on Umbellifers (a male and a female) and although they did take some floral food, the flower's main use seemed to be as a vantage point on which to wait for prey. Recorded from Graubünden (BENSON, 1961).

R. viridis (L.)

1 ♀, Herrenrüti, OW, 13.vii.79. Taken on Alnus. This species is apparently polyphagous, but since it apparently prefers Alnus or Populus, the limited occurrence of these plants locally is reflected in its abundance. Recorded from Wallis, Graubünden (BENSON, 1955a, 1961), Zürich (DIETRICH, l.c.). STECK (1.c.) says that in general this is one of the commonest sawflies, both in the plains and in the mountains, but the majority of his specimens were probably of chlorosoma.

R. punctulata (Klug)

2 ♀, 2 ♂, Trüebsee, NW, 11.vii.77. 4 ♀, 2 ♂, Firnalpeli, OW, 5.vii.79. An even more voracious predator than chlorosoma. When the specimens from Trüebsee were caught they were all put in the same container. When I next looked at the container, all that remained of the males were the wings, legs, head capsules and less than half of one specimen's thorax, all the rest had apparently been eaten by the females. The exoskeleton of R. punctulata is peculiarly soft and it is this quality that seems to have enabled the females to eat so much of the males. This species also attacks larvae of Lepidoptera and Symphyta, larvae and pupae of Chrysomelidae (Coleoptera) and most adult insects of an inferior size that it is capable of catching and that its mandibles can deal with. I have not seen it taking floral food. The Swiss specimens I have found were all associated with Rosa. Recorded as common in the mountain regions by STECK (l.c.).

Tenthredo Linnaeus (Keys by ENSLIN, 1910 & 1920)

T. maculata Geoffroy

1 ♀, Herrenrüti, OW, 8.vii.78. This specimen is of the typical subspecies found over much of Western Europe. BENSON (1968) and ZIRNGIEBL (1940) together list seven other subspecies found on the edges of the species' European range. Only maculata ssp. semseyi Mocsáry reaches the extreme South-East of Switzerland from its main distributional areas in Hungary, Austria and Czechoslovakia. Typical subspecies recorded from Bern, Zürich, Wallis, Glarus and Aargau.

T. temula Scopoli

1 ♂ , Wiesenberg, NW, 15. vii. 78. 3 ♀ , and larvae on Origanum vulgare L., Hüsli, NW, 12. vii. 77. Adults were all found on Umbellifers. Very abundant throughout Switzerland. BENSON (1968) treated celtica Benson as a subspecies of temula. The various subspecies of maculata have the same value as celtica in relation to temula: that is to say that they differ from each other in the morphology of the thorax as well as in coloration.

T. atra L.

1 ♀ , 2 ♂ , Trüebsee, NW, 11. vii. 78. 3 ♀ , Brunni, NW (on inflorescences of Succisa pratensis Moench), 16. vii. 78. 1 ♀ , Firnalpeli, OW (on inflorescence of Veratrum album L.), 8. vii. 79. Recorded by STECK (l. c.) as common in whole country.

T. velox F.

7 ♀ , Fräkmuntegg, NW, 16. vii. 77 and 8. vii. 78. 2 ♀ , 1 ♂ , Trüebsee, NW, 11. vii. 77. 3 ♀ , Wirsweli, NW, 12. vii. 78 and 13. vii. 79. 2 ♀ , 2 ♂ , Haldigrat, NW, 11. vii. 79. 1 ♀ , Ende der Welt, OW, 15. vii. 79. "T. velox v. alpicola de STEIN. Pilatus 20. vii. (FREY-GESSNER)" (STECK, l. c.). Recorded from Wallis, Bern, Graubünden, Uri and Tessin (STECK, l. c.).

T. balteata Klug

1 ♂ , Trüebsee, NW, 11. vii. 78. 2 ♀ , Beckenried, NW, 8. vii. 79. 1 ♀ , Hergiswil, NW, 7. vii. 78. Previously recorded from Bern, Zürich, Tessin, Glarus, Uri (STECK, l. c.) and Graubünden (BENSON, 1961).

T. limbata Klug

1 ♀ , Brunni, NW, 16. vii. 78. On Aegopodium podagraria L. foliage in a shady wood of Fagus sylvatica L. Found throughout Europe and Siberia (but not British Isles), but rare. Biology unknown. A single specimen was taken by STECK at Grono (Tessin) in July 1885 (STECK, l. c.). VI-VII.

T. ferruginea Schrank

1 ♀ , Hergiswil, NW, 6. vii. 77. Recorded from Bern, Aargau, Zürich, Wallis (STECK, l. c.) and Graubünden (BENSON, 1961).

T. livida L.

4 ♀ , 2 ♂ , Oberrickenbach, NW, 17. vii. 78. 2 ♀ , Hüsli, NW, 14. vii. 78. 3 ♀ , 2 ♂ , Dallenwil, NW, 14. vii. 78. 1 ♂ , Wiesenberg, NW, 15. vii. 78. All from Salix spp. growing in light woodland. Recorded from Aargau, Bern, Schwyz, Zürich, Wallis (STECK, l. c.) and Graubünden (BENSON, 1961).

T. colon Klug

1 ♀ , Dallenwil, NW, 14. vii. 78. With the T. livida noted above. Recorded from Solothurn, , Graubünden and Zürich (STECK, l. c.).

T. albicornis F.

1 ♂ , Oberrickenbach, NW, 14. vii. 77. 2 ♀ , Alp-Gschwänd, NW, 16. vii. 78. 3 ♀ , 2 ♂ , Fräkmuntegg, NW, 8. vii. 78. 4 ♀ , Niederrickenbach, NW, 12. vii. 78, 6. vii. 79. 3 ♀ , 2 ♂ , Wirzweli, NW, 12. vii. 78, 13. vii. 79. 3 ♀ , Brunni, NW, 16. vii. 79. 2 ♀ , Ende der Welt, OW, 15. vii. 79. 2 ♀ , 3 ♂ , Herrenrüti, OW, 11. vii. 77. RUDOW (in ENSLIN, 1912-17) records the larva as feeding

on Angelica, and certainly it was usually on the flowers of this plant that I found the insect. Common throughout Central Europe, Siberia and also in the mountains of Southern Europe. VI-VII.

The adults of this species, like most Tenthredo, are predatory. One female albicornis ate a female specimen of Cuneala koehleri (Klug) with which it was confined. STECK (l.c.) records this insect as commoner in the Swiss plain than in the mountains.

T. rossii (Panzer)

1 ♀, Alp-Gschwänd, NW, 5.vii.79. This specimen was caught flying near a wet flush full of Senecio arvensis L., its foodplant (see KONTUNIEMI, 1952), but neither larvae nor further adults could be obtained.

WEIFFENBACH (1956) tried to show that this species is conspecific with bifasciata Müller, stecki (Konow) and koehleri Klug. There are grounds for doubting the specific status of some species in the bifasciata group: BENSON (1968) thought that diversipes Mocsáry might be a subspecies of bifasciata. The species considered by WEIFFENBACH differ so markedly, however, that sound genetic evidence would be needed to verify his opinions. In any case, his treatment of koehleri, now placed in a different genus, is quite wrong.

STECK (l.c.) records this species as "more widely distributed than the previous species [bifasciata], from June to August". Recorded from Graubünden (BENSON, 1961).

T. scrophulariae L.

1 ♀, Oberrickenbach, NW, 14.vii.77. STECK (l.c.) records scrophulariae as not uncommon and widely distributed.

T. vespa Retzius

3 ♀, Oberrickenbach, NW, 14.vii.77. 1 ♀, Hergiswil, NW, 14.vii.78. 1 ♀, Dallenwil, NW, 14.vii.78. 2 ♀, Niederrickenbach, NW, 12.vii.78. 2 ♀, 5 ♂, Wiesenberg, NW, 15.vii.78, 8.vii.79. 3 ♀, Kernalpbach, NW, 7.vii.79. 2 ♂, Dörfli, NW, 12.vii.79. 1 ♀, Herrenrüti, OW, 20.vii.77. Mostly from inflorescences of Umbelliferae. STECK (l.c.) records vespa as common in July and August over the whole of Switzerland.

[T. amoena Gravenhorst

"Pilatus VII.80 (A.MUELLER)" STECK (l.c.). Also from Bern, Tessin, Zürich (STECK) and Graubünden (BENSON, 1961).]

Tenthredo arcuata species complex. European members keyed by BENSON (1959).

The adult insects in this group visit a wider range of inflorescences than any other sawfly. They are not so voraciously predatory as most Tenthredo and regularly take floral food as well as small, soft-bodied Diptera and Hemiptera that they find on flowers.

T. algoviensis Enslin

26 ♀, 5 ♂, Alp Gschwänd, NW. On several dates in all years. 2 ♀, Haldigrat, NW, 11.vii.79. 14 ♀, Trüebsee, NW, 11.vii.77, 10.vii.79. 1 ♀, Brunni, NW, 8.vii.77. 3 ♀, Wirzweli, NW, 12.vii.78. 3 ♀, 1 ♂, Ende der

Welt, OW, 15.vii.79. 10 ♀, Herrenrüti, OW, 5.vii.79. Always found together with T. aegra. Common in subalpine and low alpine localities (1100-1800 m), but also as a vagrant 300 m above or below this range. Larva and foodplant associations unknown.

The form of the yellow markings on the female's abdomen vary greatly. I have two specimens with only a very thin, laterally interrupted, yellow marginal band on the first tergite. The yellow bands normally present on the 3rd, 4th and 7th tergites are also obsolete. Both of these specimens came from the Trüebsee, just above the treeline at 1800 m, and on the upper limit of this species' altitudinal range. They are probably similar to the specimens of schaeffferi forma perkinsi (Morice) with unusually infuscate 1st abdominal tergites noted by BENSON (1959) from high altitudes in Switzerland and the Elburz Mountains of Northern Iran.

Found in the Pyrenees, and the Alps of France, Switzerland, Austria and Transylvania. Records of T. schaefferi Klug in STECK (l.c.) seem to refer mainly to this species (the comment made under A. koehleri Klg. is significant: "Kommt wie die beiden folgenden Arten nur in der montanen Region vor."). Known from Wallis, Graubünden (BENSON, 1955a, 1961), Bern, Glarus and Tessin (STECK, l.c.). VI-VIII.

T. aegra Enslin

30 ♀, 15 ♂, Alp-Gschwänd, NW. Many occasions. 43 ♀, 17 ♂, Fräkmuntegg, NW. Many occasions. 2 ♀, Brunni, NW, 16.vii.78. 17 ♀, Wirzweli, NW, 16.vii.77, 13.vii.79. 7 ♀, 2 ♂, Haldigrat, NW, 11.vii.79. 3 ♀, Alpboden, NW, 11.vii.79. 10 ♀, 3 ♂, Rinderbühl-Stockhütte, NW, 15.vii.79. 39 ♀, 6 ♂, Herrenrüti, OW, 15.vii.78, 13.vii.79. The males of this species were undoubtably commoner than is indicated by the numbers taken, for only those found in coitu were taken.

BENSON (1959) considered aegra to be an alpine subspecies of arcuata isolated from the lowland race by the belt of coniferous forest so characteristic of the Central European mountains. BENSON found the species in alpine meadows above the treeline, but the present writer found it to be very common in both subalpine and alpine habitats, with broadly the same altitudinal distribution as algoviensis, but reaching higher (1100-2000 m). Females are exceedingly variable in colouration, and I have even seen specimens with the black basal band on each tergite continued to the edge of the segment, as in the typical schaefferi Klug.

Found in the Pyrenees and the Alps of Bavaria, France, Switzerland, Austria, Yugoslavia and Transylvania. Recorded from Graubünden (BENSON, 1961), Uri, Tessin, Zug, Wallis and Bern (STECK, l.c.). VI-VIII.

T. schaefferi forma perkinsi Morice

10 ♀, Fräkmuntegg, NW, 8.vii.77. 6 ♀, 2 ♂, Alp-Gschwänd, NW, 16.vii.78. 13 ♀, Brunni, NW, 8.vii.78. 3 ♀, 3 ♂, Oberrickenbach, NW, 7.vii.79. 18 ♀, 7 ♂, Niederrickenbach, NW, 16.vii.77, 6.vii.79. 9 ♀, 4 ♂, Hüsli, NW, 12.vii.77. 11 ♀, 1 ♂, Wirsweli, NW, 16.vii.77, 12.vii.78. 2 ♀, Wolfenschiessen, NW, 9.vii.78. 7 ♀, 6 ♂, Wiesenberg, NW, 8.vii.79. 3 ♀, Rinderbühl-Stockhütte, NW, 15.vii.79. 2 ♀, Trüebsee, NW, 11.vii.78. 14 ♀, 4 ♂, Herrenrüti, OW, 8.vii.78, 5.vii.79. The commonest species

in this group in the area, though only a few specimens were taken from each locality. Chiefly in the lower meadows, but reaching to the treeline.

This sawfly, the commoner form of schaefferi, has for a long time been confused with arcuata Förster (and still is by certain authors) so that there are few Swiss records reffering to it, but it is probably common throughout the country.

T. arcuata Förster

3 ♀, 5 ♂, Brunni, NW, 8.vii.78. 4 ♀, Wirzweli, NW, 13.vii.79. 12 ♀, Trüebsee, NW, 11.vii.78. Only definite records of this species are from Graubünden and Wallis (BENSON, 1961, 1955a), but probably common over the whole region.

T. acerrima Benson

4 ♀, Alp-Gschwänd, NW, 16.vii.78. 7 ♀, Hergiswil, NW, 17.vii.78. Probably with the same pattern of distribution as arcuata.

T. sulphuripes (Kriechbaumer)

1 ♂, Haldigrat, NW, 11.vii.79. A species of the Central European Alps. Larva recorded by CARPENTIER (1907) as feeding on Bupleurum falcatum L. A scarce insect. The only Swiss record I know of is from Wallis (BENSON, 1950a).

T. olivacea Klug

17 ♀, 14 ♂, Alp-Gschwänd, NW, 8.vii.77. 2 ♂, Brunni, NW, 16.vii.78. 1 ♀, Kehrsiten-Bürgenstock (450 m), NW, 14.vii.79. 26 ♀, 9♂, Fräkmuntegg, NW, 8.vii.77, 10.vii.79. 10 ♀, Trüebsee, NW, 11.vii.78. 3 ♀, 9 ♂, Haldigrat, NW, 11.vii.79. 10 ♀, Herrenrüti, OW, 5.vii.79. Very abundant in subalpine and alpine habitats. The adults of this species vie with Rhogogaster in the variety of insect prey that they will attack. Recorded from Wallis and Graubünden (BENSON, 1955a, 1961).

T. mesomelas L.

This common species was found at almost every locality in considerable numbers. Recorded by STECK (l.c.) as common in the plains and mountains from June to August.

T. obsoleta Klug

2 ♀, 2 ♀, Fräkmuntegg, NW, 16.vii.78, 5.vii.79. 1 ♀, Trüebsee, NW, 11.vii.77. 3 ♀, Haldigrat, NW, 11.vii.79. 1 ♂, Ende der Welt, OW, 15.vii.79. Taken with specimens of mesomelas in subalpine and alpine localities. Recorded from Graubünden (BENSON, 1961).

T. mioceras Enslin

1 ♀, 2 ♂, Fräkmuntegg, NW, 8.vii.78. 1 ♂, Trüebsee, NW, 10.vii.79. With the preceding species. Recorded from Wallis and Graubünden (BENSON, 1955a, 1961).

Cuneala Zirngiebl, 1956

Species keyed by BENSON (1968). This genus is characterised principally by the very long mouthparts with which the adult insects are able to obtain the nectar of plants such as Geranium ssp. with concealed nectaries. Only one

species, C. koehleri (Klug), is known to have a distribution extending into Central and Western Europe, the others apparently being restricted to the South and East.

C. koehleri (Klug)

22 ♀, 19 ♂, Wirzweli (Eggwald), NW, 12.vii.78, 13.vii.79. 10 ♀, 3 ♂, Rinderbühl-Stockhutte, NW, 15.vii.79. 4 ♀, 1 ♂, Ende der Welt, OW, 15.vii.79. All taken from flowers of Geranium pratense L.

BENSON (1961) records specimens taken in Graubünden as "Mostly taken from flowers of Geranium species", so it would seem likely that the larva, which is not yet known, feeds on Geranium.

Specimens were found singly in the early morning curled round the bases of the central organs of the flower with their weight resting on the petals (the axis of the flower is usually nearly horizontal in G. pratense). This sawfly much resembles one of the solitary bees whilst in this attitude. If the weather is cool and dull, all specimens in the area seem to stay on the same flower for most of the day. For some reason certain patches of this flower were favoured above others in the same meadows. On hot days the insect is highly active and flies from flower to flower. Both nectar and pollen are taken. C. koehleri apparently has a specific attachment to this flower and its heavily sculptured and pubescent body surface probably contribute to make it a fairly important pollinator in certain localities.

Known from the mountains of Southern and Central Europe (see HELLÉN, 1967). Recorded from Zürich, Wallis, Uri, Bern and Tessin (STECK, l.c.). VI-VIII.

Pachyprotasis Hartig

P. rapae (L.)

5 ♀, Alp-Gschwänd, NW, 8.vii.78. 2 ♀, Oberrickenbach, NW, 6.vii.78. 1 ♀, Brunni, NW, 17.vii.77. 3 ♂, Diegisbalm, NW, 7.vii.79. Recorded from Zürich, Wallis (DIETRICH, l.c.), Graubünden (BENSON, 1961) and Schwyz (PETER, l.c.). STECK (l.c.) comments that it is commoner in the plains than in the meontains.

P. nigronotata Kriechbaumer

1 ♀, Kernalpbach, NW, 7.vii.79. Swept from very dry hay meadow. I know of no other records of this sawfly from Switzerland.

P. antennata (Klug)

1 ♂, above Wirzweli, NW, 13.vii.79. In a deeply shaded part of the Egg-wald. WEIFFENBACH (1953) has found the larva on Senecio fuchsii Gmelin and Atropa belladonna L., and it was probably from the former plant that this specimen came. Recorded from Bern, Aargau and Tessin by STECK (l.c.).

Macrophya Dahlbom

M. albicincta (Schrank)

2 ♀, and larvae on Valeriana officinalis L., Oberrickenbach, NW, 5.vii.78. Recorded from Bern, Aargau, Wallis, Glarus (STECK, l.c.), Zürich

(DIETRICH, l.c.) and Graubünden (BENSON, 1961).

M. albipuncta (Fallén) (=friesei Konow)

1 ♂, Fräkmuntegg, NW, 8.vii.78. Recorded from Zürich (STECK, l.c.).

Nematinae

Cladius Illiger

C. difformis (Panzer)

3 ♀, at light with specimens of Arge ustulata, Hergiswil, NW, 10.vii.77. Probably throughout the region. STECK (1.c.) notes that FREY-GESSNER reared a specimen from a Diplolepis rosae (L.) gall.

Priophorus Dahlbom

P. pilicornis (Curtis)

1 ♀, Dörfli, NW, from Ulmus. 12.vii.79. Recorded as feeding on Ulmus by CARPENTIER (1886-88) and on Crataegus by BENSON (1951-58). Not previously recorded in Switzerland.

Trichiocampus Hartig

T. viminalis (Fallén)

1 ♀, Hergiswil, NW, from ornamental Populus nigra L. 10.vii.77. Recorded from Bern and Zürich (STECK, l.c.)

Hemichroa Stephens

H. crocea (Geoffroy)

2 ♀, Wirzweli, NW, 12.vii.78. Recorded from Bern, Luzern and Graubünden (STECK, l.c.).

Pseudodineura Konow

P. enslini (Hering)

Mines common in Trollius europaeus L. at Herrenrüti, NW, 11.vii.77, 15.vii.78. Recorded from Wallis (BENSON, 1955a).

Pristiphora Latreille

P. alnivora (Hartig)

1 ♀, Oberrickenbach, NW, 6.vii.78. Found near meadow full of Aquilegia vulgaris L. Although this insect is recorded in most of the big monographs as occurring in Switzerland, few actual records exist for it.

P. pallidiventris (Fallén)

3 ♀, Wiesenberg, NW, 15.vii.78. 1 ♀, Trüebsee, NW, 11.vii.77. Recorded by STECK (l.c.) from Bern, Zürich, Glarus, Schwyz and Graubünden, and from Zug by PETER (l.c.).

P. moesta (Zaddach)

1 ♀, reared from larvae on Malus, Hergiswil, NW, 14.vii.78. Recorded

from Switzerland by ENSLIN (1912-17).

P. grönblomi (Lindqvist)

2 ♂, Trüebsee, NW, 10.vii.79. From dwarf Salix. Not previously known from Central Europe. Recorded from Northern Sweden, Northern USSR, Finnish Lappland and Scotland. The authorship of Lygaeonematus grönblomi is often attributed to HELLÉN by British writers, but the taxon was actually described by LINDQVIST (1952).

P. friesei (Konow)

1 ♀, Trüebsee, NW, 11.vii.79. Larva on Salix ssp. Recorded from Wallis and Graubünden (BENSON, 1955a, 1961). Alps of Central Europe. VI-VII.

P. coactula (Ruthe)

1 ♂, Trüebsee, NW, 11.vii.78. Larva on Salix. Recorded from Wallis and Graubünden (BENSON, 1955a, 1961). Holarctic alpine-arctic species (BENSON, 1962a) and probably not really distinct from P. borea (Konow) and P. lativentris (Thomson).

P. borea (Konow)

2 ♂, Trüebsee, NW, 10.vii.79. Exactly the same range as coactula.

P. staudingeri (Ruthe)

1 ♀, 1 ♂, Trüebsee, NW, 10.vii.79. Some confusion has arisen between this species, with its larva on Salix, and P. puncticeps (Thomson) feeding on Vicia cracca L. (STEIN, 1885). The two were shown to be distinct by LINDQVIST (1953). P. staudingeri has been recorded from Wallis and Graubünden (BENSON, 1955a, 1961).

P. compressa (Hartig)

2 ♀, Fräkmuntegg, NW, 16.vii.78. WONG (1975) has written an interesting paper on the abietina group with keys to species based on genitalic characters. Of interest to British entomologists are his discoveries that P. thalenhorsti Wong and possibly also P. decipiens (Enslin) and P. gerula (Konow) occur in Britain. He also found that the penis valve that BENSON figures for saxesenii (Hartig) is that of decipiens, whilst the saw saxesenii is that of gerula. P. compressa has been recorded from the Jura (WONG, l.c.) and Graubünden (BENSON, 1961).

Sharliphora Wong

S. ambigua (Fallén)

1 ♂, Trüebsee, NW, 11.vii.78. Recorded from Schweizerhalle (STECK, l.c.), Graubünden (BENSON, 1961) and Bern (PETER, l.c.).

Amauronematus Konow

A. arcticola (von Dalla Torre)

2 ♂, Trüebsee, NW, 10.vii.79. Recorded from Graubünden (BENSON, 1961).

A. fallax (Lepeletier)

2 ♀, Dallenwil, NW, 14.vii.78. On Salix alba L. Recorded from Wallis (STECK, l.c.).

Nematinus Rohwer

N. bilineatus (Klug)

1 ♀, Aa at Herrenrüti, OW, from Alnus glutinosa. 5.vii.79. This specimen is of the form luteiformis Enslin. Scarce insect distributed over much of Central and Northern Europe, but absent from Britain. VI-VII. The specimens seen by STECK in the Zürich Polytechnikum's collection are from Germany (Pfalz). Not recorded before from Switzerland.

N. abdominalis (Panzer)

1 ♀, Wiesenberg, NW, 15.vii.78. Recorded from Zürich, Bern and Wallis (STECK, l.c.). I have also found abdominalis (1 ♂) at the Teufelsgraben, Kanton Solothurn.

Euura Newman

E. mucronata (Hartig)

2 ♀, Trüebsee, NW, 11.vii.77. Galls common on various Salix ssp. at many localities.

Pontania O. Costa

P. pedunculi (Hartig)

1 ♂, Fräkmuntegg, NW, 8.vii.79. Probably common throughout the country.

P. vesicator (Bremi)

Galls abundant on Salix purpurea L. Although the closely related P. pustulator Forsius is known to attack a number of Salix ssp., vesicator is thought to be monophagous on purpurea, the records given by early cecidologists of this species from various arctic and alpine willows are misidentifications (BENEŠ, 1968). Distribution in Switzerland is discussed by STAEGER (1919).

P. proxima (Lepeletier)

Galls found on planted Salix fragilis L. growing in a garden in Hergiswil, NW, 15.vii.77. Throughout lowland Switzerland.

P. dolichura (Thomson)

2 ♀, and galls on S. purpurea L., Alp-Gschwänd, NW, 10.vii.79. Probably throughout the mountainous areas.

P. crassipes (Thomson)

3 ♀, Trüebsee, NW, 10.vii.79. A large part of the crassipes species complex has been studied by BENEŠ (1967). A full synonymy for the species is given in BENSON (1960b). Throughout alpine Switzerland. Recorded from the following willows: S. herbacea L., S. polaris Wallenb., S. myrsinites L., S. alpina Scop., S. arctica Pallas, S. arbuscula L. and S. lapponum L.

P. retusae Benson, 1960a

Galls abundant on Salix retusa L., Alp-Gschwänd and Fräkmuntegg, NW, 10.vii.79. This species is now known from Switzerland and Czechoslovakia feeding on S. kitaibeliana Willd. and S. serpyllifolia Scop. as well as retusa. Probably throughout subalpine and alpine Switzerland. VI-VII.

P. bridgmanii (Cameron)

Galls on Salix cinerea L. at Niederrickenbach, NW, 12.vii.78. Also at Fräkmuntegg, NW, 10.vii.79. Throughout the country.

P. jörgensoni (Enslin)

1 ♀, Firnalpeli, OW, 5.vii.79. Biology of this species uncertain. JOERGENSON (1906) said that the insect was a gall maker on Salix aurita L., caprea L. and cinerea L. (and if this is the case, as seems likely, the gall has probably been confused with that of P. pedunculi). Recorded from much of Central and Northern Europe.

P. viminalis (L.)

1 ♀, and galls on Salix alba L., Wolfenschiessen, NW, 9.vii.78. Galls on S. nigricans Sm., Herrenrüti, OW, 5.vii.79. Probably throughout Switzerland.

SUMMARY

Records of just over one hundred sawfly species collected in Central Switzerland (Unterwalden) are given. Many of these are new additions to the known fauna of Switzerland, and nearly all are the first records for this particular area. Pristiphora grönblomi (Lindqvist) is newly recorded from Central Europe.

It is hoped that the results of work on the genera Nematus and Pachynematus together with further species in the groups already covered will be presented at a future date.

ZUSAMMENFASSUNG

In diesem Bericht sind einige im Kanton Unterwalden gefundene Blattwespen aufgeführt. Ueber die Verbreitung dieser Gruppe im Kanton Unterwalden waren bis jetzt nur sehr wenige Angaben vorhanden. Der Verfasser sammelte die Exemplare im Juli während der drei Jahre 1977-79. Die meisten Exemplare wurden im Halbkanton Nidwalden gefunden, doch sind auch Exemplare aus Obwalden im Verzeichnis aufgeführt. In der Einführung ist eine Liste der besuchten Oertlichkeiten enthalten. Diese sind nach der Höhe in drei Gruppen eingeteilt. Viele Arten sind noch nicht ins Verzeichnis der schweizerischen Tierwelt aufgenommen worden. Ausser eine sind alle Arten in den Nachbarländern zu finden.

Man kommt zu dem Schluss, dass die in den Niederungen dieses Kantons lebende Blattwespen, charakteristisch zentraleuropäisch sind. Viel mehr alpine und subalpine Arten als hier erwähnt müssen in Unterwalden existieren, und sie bilden eine faunistische Einheit, die derjenigen gleicht, die der verstorbene Herr R.B.BENSON seinerzeit in Graubünden und im Wallis festgestellt hat. Nur eine Art wurde erstmals in Zentraleuropa festgestllt; es handelt sich um die früher nur in Nordeuropa gefundene Pristiphora grönblomi (Lindq.). Deshalb muss man sie als eine der vielen arktisch-alpinen Blattwespen betrachten, die man in der Unterfamilie Nematinae kennt.

Abschliessend ist zu betonen, dass diese Arbeit nur als ein Fundament betrachtet werden sollte, zu dem man weitere Bemerkungen hinzufügen kann. Man könnte noch viele andere Arten finden, wenn man früher im Jahr sammeln würde. Diejenigen, die sich mit Blattwespen befassen, haben nur ein

paar wenige Kantone untersucht; in jeder Gegend gibt es aber noch viel wichtige Arbeit zu tun.

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P. CAPDEVILLE. DIE GEOGRAPHISCHEN RASSEN von Parnassius apollo

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