

## On the identity of *Pontania dolichura* (Thomson, 1871) and *Pontania femoralis* (Cameron, 1876) (Hymenoptera: Tenthredinidae: Nematinae)

Veli Vikberg & Pekka Malinen

Vikberg, V. & Malinen, P. 2012: On the identity of *Pontania dolichura* (Thomson, 1871) and *Pontania femoralis* (Cameron, 1876) (Hymenoptera: Tenthredinidae: Nematinae). – Sahlbergia 18(1): 25-39

The lectotype of *Pontania dolichura* (Thomson, 1871) represents the species which induces galls on *Salix lapponum* L. Its new synonym is *Pontania lapponicola* Kopelke, 1994, syn. nov. A lectotype is designated for *Pontania femoralis* (Cameron, 1876); according to the original description the larval food plant of the species is *Salix phylicifolia* L. *Pontania robbinsi* Benson, 1935 is an objective synonym of it. New adult characters are presented to separate the two species from each other. *Pontania nigricantis* Kopelke, 1986, based on the galls on *S. myrsinifolia* Salisb., is added to the fauna of Finland.

*Pontania dolichura* -lajiryhmän sahapistiäiset aiheuttavat luonteenomaisia äkämiä pajujen lehtiin: makkaramaisia äkämiä on useimmiten kaksi vierekkäin keskisuonen molemmin puolin ja ne pullistuvat vain yläpinnan puolelle. Ryhmän eri lajit elävät eri pajulajeilla ja yleensä vain yhdellä tai joskus kahdella lähisukuisella lajilla. Lajiryhmän nimikkolaji *Pontania dolichura* (Thomson) aiheuttaa äkämiä lapinpajulle (*Salix lapponum*) ja sitä tavataan Suomessa lähinnä Lapissa (eteläisin löytöpaikka on Salla). Sen uudeksi synonyymiksi tulee *Pontania lapponicola* Kopelke. Ainoa Etelä-Suomessa tavattava ryhmän laji aiheuttaa äkämiä kiiltopajulle (*Salix phylicifolia*) ja sen käypä nimi on *Pontania femoralis* (Cameron). *Pontania robbinsi* Benson on tämän objektiivinen synonyymi. Läheinen laji *Pontania nigricantis* Kopelke aikaansaa äkä-mät mustuvallepajulle (*Salix myrsinifolia*). Sen äkämiä löytyi nyt Kilpisjärven alueelta Suomelle uutena.

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### 1. Introduction

The species of the *Pontania dolichura* group induce very characteristic galls on the leaves of the species of *Salix*: these are mostly sausage shaped and often paired one each side of the mid-rib of the leaf and project only from the upper surface of the leaf (Benson 1958).

The adults of *P. dolichura*-group are rather similar to those of the leaf rolling species of *P. crassispina* group, and differ from them by their not distinctly tuberculate vertex and frons and by the longer cerci of females, and longer antennae of males (Zinovjev & Vikberg 1999). This leaf rolling species group had been included in *Phyllocolpa* Benson by most authors,

but recently a new genus, *Tubpontania*, was created for it (Vikberg 2010). The studies of Kopelke (1986, 1987, 1990, 1994, 1999) have greatly changed the species concept in *Pontania dolichura* group: the earlier monotypic Holarctic group of Benson (1960) contains now up to seven named species alone in North and Central Europe. According to Kopelke (1994, 1999) the following five species are known in North Europe, each of them monophagous or nearly monophagous on one species of *Salix*: *P. dolichura* (Thomson, 1871) makes galls on *Salix phylifolia* L., *P. glaucae* Kopelke, 1994 on *S. glauca* L., *P. lapponicola* Kopelke, 1994 on *S. lapponum* L., *P. nigricantis* Kopelke, 1986 on *S. myrsinifolia* Salisb. (= *S. nigricans* Sm.), and *P. virilis* Zirmgiebl, 1955 on *S. purpurea* L. In addition, galls of the group are known on *Salix caprea* L. in Finland (Vikberg 1970, Kokkonen 2000, and Zinovjev 1999) and in Norway (Kopelke 1999), on *S. myrsinites* L. in Finland (Vikberg 1970) and Norway (Kopelke 1999), on *S. repens* L. ssp. *rosmarinifolia* (L.) Andersson in Leningrad region, Russia and Estonia (Zinovjev 1999) and on *S. starkeana* Willd. ssp. *cinerascens* (Wahlenb.) Hultén (syn. *S. bebbiana* Sarg. and *S. xerophila* Flod.) in Finland (Kokkonen 2000, Vikberg, own observations, Zinovjev 1999). Galls of the species-group have been published from N. Europe on *S. arbuscula* L. (Norway: Trail 1889), on *S. hastata* L., *S. herbacea* L. (Norway: Zinovjev 1999), *S. lanata* L. (Britain: Benson 1958) and *S. polaris* Wahlenb. (Scandinavia: Coulianos & Holmåsén 1991), but these may be only subsidiary host plants. The adults of the group are very difficult to distinguish, and many characters show considerable variation. In the catalogue of World Symphyta (Taeger & al. 2010) the species of *Pontania dolichura* group are listed under *Pontania* subgenus *Pontania* from West Palaearctic and *Pontania dolichura* in addition from the Nearctic.

Kopelke (1985, 1986) treated *Pontania doli-*

*chura* as a species feeding on *Salix purpurea*, but later he (Kopelke 1990) considered *Salix phylificifolia* as its host plant and synonymized *Pontania femoralis* (Cameron, 1876) with it. In this paper the identity of *P. dolichura* and of *P. femoralis* is reinvestigated and the study shows that they are not synonyms. New distinguishing adult characters are presented for them. *P. nigricantis* is added to the fauna of Finland.

## 2. Material and methods

Galls of the *Pontania dolichura* group have been collected in Finland since 1965 and S. Norway in August 1968. Full grown larvae were let to make cocoons in small glass vials with fine sand, moss (*Sphagnum*) and a piece of rotten wood. Overwintering took place outside in larger boxes filled with crushed newspaper etc. in soil, inside snow or in sheltered place under cover.

The following acronyms are used for collections where material examined is deposited (colleagues responsible for institutional collections in parentheses):

BMNH= Natural History Museum, London, U.K. (Gavin Broad; syntypes of *Nematus femoralis* Cameron and *Pontania robbinsi* Benson were loaned in 1990es by Christine Taylor)

CVV= private collection of Veli Vikberg, Turenki, Finland

FNMS= Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany (Jean-Peter Kopelke)

MZH= Zoological Museum, Division of Entomology, University of Helsinki, Finland (Pekka Malinen; in 1990's the loaned specimens were in Department of Applied Biology, University of Helsinki, curator Martti Koponen)

ZML= Zoology Museum, University of Lund, Sweden (Roy Danielsson; The specimens of *Nematus dolichurus* were loaned from C. G. Thomson's collection)

In order to possibly find more syntypes of *Nematus femoralis* an inquiry was sent to following institutions: Natural History Museum, London (Suzanne Lewis, Christine Taylor), Oxford University Museum (Chris O'Toole), Hunterian Museum, University of Glasgow (Geoff Hancock), Kelvinrove Museum and Art Gallery, Glasgow (Richard Sutcliffe), National Museums of Scotland, Edinburgh (Mark R. Shaw) and Nationaal Natuurhistorisch Museum, Leiden (Cees van Achterberg; Cameron sent specimens for comparison to Dr. Van Vollenhoven) but no further syntypes were found.

Morphological terminology follows Goulet & Huber (1993), Viitasaari (2002), and Vikberg (2003). Specimens were studied and measurements were made as described in Vikberg & Zinovjev (2006) or Vikberg (2010); the length of the hind femur was measured with trochantellus (except some older measurements which are mentioned). Body parts are measured in millimeters. The annuli of the lancet are counted from the base towards the tip of the lancet starting with annulus 1.

The names of *Salix* are according to Hämet-Ahti & al. (1998), Jonsell (2000) and Skvortsov (1999).

Senior author VV is responsible for the taxonomic decisions. Author PM adjusted the scatter diagrams to electronic format and took the photographs of the lancets.

### 3. Results

3.1. *Pontania dolichura* (Thomson, 1871) (= *P. lapponicola* Kopelke, 1994, syn. nov.). The food plant is *Salix lapponum* L.

The oldest and nominate species of the group, *Nematus dolichurus* was shortly described in both sexes from Ångermanland and Jämtland in Sweden (Thomson 1871). Lindqvist (1954) studied four female syntypes but he did not select a lectotype; he merely considered the species as a valid species of *Pontania* and regarded *P. robbinsi* Benson as its synonym. Kopelke (1990) designated the lectotype female [it is also labelled "*dolichurus* typ" in E. Lindqvist's handwriting] and a paralectotype male from Skalstugan in Jämtland, Sweden which became thus the type locality of the species. Both specimens are labelled "Skilstgn 16.21.7. [18]40." (old hand written ink label; coll. ZML) and they were thus collected at the same time in Skalstugan. The coordinates of the type locality are 63°34'N 12°17'E; it is ca 540 m high and at the border of regio alpina which is quite near (about 6 km) the Norwegian border. The lectotype female and the paralectotype male bear the determination label by Kopelke III.1988, and the specimens seem to represent the same species according to the colour and morphological characters.

Other syntypes of *Nematus dolichurus*: in Thomson's collection there are seven additional females collected from Skalstugan and labeled "Skilstgn 16.21/7 40 or 16.21.il.40". Kopelke did not examine them because they do not bear his identification labels. They belong to the same species as the lectotype and are also paralectotypes of the species. One female from Kälähög (labeled Kälähög 22.il.40) is almost identical with the lectotype and it is also a paralectotype of *Nematus dolichurus*. It bears the label "*Pontania dolichura* (Thoms.) ♀ Kopelke det 1988" but it is not mentioned by him (Kopelke 1990, 1994). Kälähög, Jämtland is mentioned in some old entomological articles, but it could not be located in any maps. Dr. Hege Vårdal guessed that it actually could be Kjörlhaugan in Meråker commune in North Trøndelag fylke, Norway, which is about 5-10

km from Skalstugan. There is one syntype female from Ångermanland, Sweden which bears the labels “Ang [=Ångermanland], Stål [=Stål leg.]” and a large cabinet label “*dolichurus*”, and the identification label “*Pontania dolichura* (Thoms. ♀) Kopelke det. 1988”. Kopelke did not mention this specimen in his revisions, and present study reveals that this paralectotype is not conspecific with the lectotype. Three remaining specimens in Thomson’s collection do not belong to syntypes: one female does not bear any locality label, and one male and female were collected from Norway.

What species of *Salix* is the host plant of *P. dolichura*? Thomson did not mention the host plant. Kopelke (1990, 1994, 1999) considered that this sawfly species is the same which he reared from galls on *Salix phylicifolia* in Norway, Sweden and Finland. However, he (Kopelke 1990) stated that the specimens reared from *S. phylicifolia* differed in some colour characters from the type specimens of *P. dolichura*.

According to Hultén (1971) and Jalas & Suominen (1976) several known food plants of *Pontania dolichura* group occur in the UTM grid of Skalstugan: *Salix arbuscula*, *glauca*, *hastata*, *herbacea*, *lanata*, *lapponum*, *myrsinifolia*, *myrsinites*, and *phylicifolia*. Kopelke (1999) listed the localities and the lots of the galls of *P. dolichura* group he had collected in Norway, Sweden and Finland; galls on *S. lapponum* were found in 18 localities, galls on *S. phylicifolia* were found in 10 localities, galls on *S. glauca* in 6 localities and galls on *S. myrsinifolia* in 3 localities. So these willows are obviously the most common food plants in Norway and adjacent area. The type specimens of *Nematus dolichurus* are most similar to specimens reared from *Salix lapponum* and *S. phylicifolia* and therefore these are below compared with each other and with the types of Thomson’s species. The specimens reared from galls on *Salix glauca* are clearly different: the

ovipositor is longer, and the tegula of female is black or brownish black.

The reared specimens used for comparison among others are following:

Austria, Zillertal, Vorderlanersbach 1450 m, galls on *Salix nigricans* taken on 6.7.1983, Kopelke leg., one female and one male emerged in 1984 (paratypes of *Pontania nigricantis* Kopelke SMFH 2065a and SMFH 2065g; FNMS)

Norway, Oppland: Dovre, Dovre fjell, Snöheim, 14 ♀ 3 ♂ reared from galls on *Salix lapponum*, galls were collected in August 1968, E. O. Peltonen leg. (CVV, MZH).

Norway, Nordland, Polarkreis/B, galls on *Salix lapponum* taken on 15.8.1993, Kopelke leg., one female and one male emerged in 1994 (paratypes of *Pontania lapponicola* Kopelke SMFH 2337a and SMFH 2338a; FNMS)

Finland, Enontekiö Lapland, Kilpisjärvi area, Leut-suvaara, regio alpina, one female and one male reared from galls on *Salix glauca* taken on 8.8.2001, V. Vikberg leg. (CVV). Saana – Jehkats, one female reared from galls on *Salix lapponum* taken on 11.8.2001, V. Vikberg leg. (CVV).

Finland, Koillismaa: Salla, Morottaja (Grid 27°E 7382:3555), 5 ♀ reared from galls on *Salix lapponum*, galls were collected on 3 July, 1989, V. Vikberg leg. (CVV).

Finland, Sompio Lapland: Sodankylä, Muotkanmaja (758:351), galls on *Salix glauca* taken on 5-6 July 1989, one female emerged in 1990, V. Vikberg leg. (CVV).

Finland, South Häme: Janakkala (674:337, 675:337, 676:337, 676:338), 1 ♂ 13 ♀ reared from galls on *Salix phylicifolia*, galls collected in June 2000, V. Vikberg leg. (CVV). South Savo: Mäntyharju, 1 male reared from gall on *Salix phylicifolia*, gall collected in 1964, E. O. Peltonen leg. (CVV). North Karelia: Juuka, 3 females 2 males reared from *S. phylicifolia*, galls collected in 1958, J. Kangas leg. (MZH, CVV). Oulu Ostrobothnia: Pudasjärvi (7255:3499), 14 ♂ 16

♀ reared from galls on *Salix phylicifolia*, galls were collected in July 2000, V. Vikberg leg. (CVV).

In southern Finland (South of Oulujärvi See) galls of *P. dolichura* group have been found only on *Salix phylicifolia*, and adults which were collected at a locality where later in the same year galls on that species of *Salix* were found, e. g. in South Häme, Tampere, Rukkamäki 1964-1966, have been used also for comparison. The adults captured in nature are often larger than the reared specimens.

The adult characters used in comparison are as follows:

Kopelke (1994) found the index of lengths of hind tarsus and sawsheath as the most useful to separate species from each other. In two figures (Kopelke 1994, figs. 12-13) he gave the mere index values of specimens of seven species he measured. The size of the measured specimens was not given. Vikberg (1970) has shown that in species of *Pontania* (all measured species belong now to *Eupontania viminalis* group) the index of lengths of lamnium of lancet and hind femur is higher in small specimens than larger specimens. The length of saw (and ovipositor or sawsheath) is more stable than many other body parts, including the legs. Therefore measured values of sawsheath and hind tarsus are better given in the form of a scatter diagram to see if index of small and large specimens differ from each other.

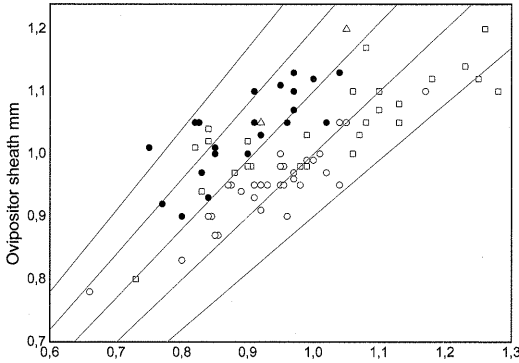
We have used in this work the ovipositor sheath/hind tarsus index presented in a scatter diagram (Fig. 1). Females reared from *Salix lapponum* and from *S. phylicifolia* locate separately from each other and smaller only hardly overlap. The ovipositor sheath/hind tarsus index is higher in specimens from *S. lapponum* than in those from *S. phylicifolia* of the same size of tarsus. In both species smaller specimens have higher index values than large specimens. Females from Skagstugan and Kälähög locate like specimens reared from *Salix lapponum* in Dovre, Polarkreis and North Finland. Females

from Rannoch, Riding Mill and Ångermanland locate like specimens reared from *Salix phylicifolia*. The only female from *Salix myrsinifolia* (paratype of *Pontania nigricantis*) locates as specimens reared from *Salix phylicifolia*.

Unfortunately the lectotype of *P. dolichura* lacks both hind tarsi. In one mid-tarsus 4 tarsomeres are left. Their combined length was measured and compared with other specimens. This comparison showed that also the lectotype belongs to the same shorter tarsus group species as other specimens from Skalstugan and Kälähög.

The values of this index are shown in a scatter diagram (Fig. 2). Specimens reared from *S. lapponum* have relatively longer sheath than specimens associated or reared from *S. phylicifolia*. In small specimens the difference is not so clear and there is overlap between species. The lectotype and paralectotypes of *Nematus dolichurus* from Skalstugan and Kälähög locate distinctly in the series of specimens reared from *Salix lapponum*. The paratype of *P. nigricantis* has an index value similar to specimens from *Salix lapponum*. Two females reared from *Salix glauca* have high index value similar to specimens reared from *Salix lapponum*. Female from Ångermanland differs clearly from other paralectotypes of *Nematus dolichurus*, and locates like large specimens associated with *Salix phylicifolia* in South Finland.

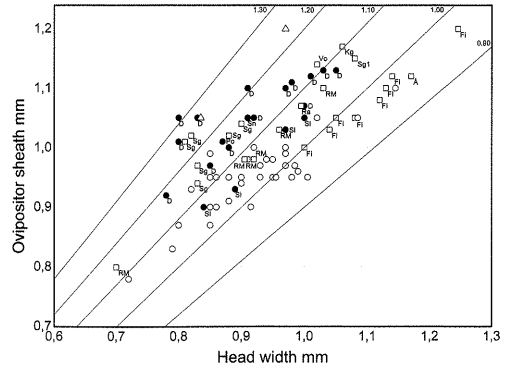
The length of lamnium of lancet can be measured without preparation of saw, if the saw is protruding enough. The values of this index are shown also in a scatter diagram (Fig. 3) because the size of specimen has similar effect as in two earlier indices. Some other species of *Pontania dolichura* group are included in the scatter diagram to show how large the variation between species can be. The smallest values (ca. 0.65-0.66) were measured in two females of *Pontania virilis* from Hessen, Germany and



**Fig. 1.** Scatter diagram showing the relationship of the length of ovipositor sheath (ordinate) and hind tarsus (abscissa) in specimens of *Pontania dolichura* group. Scale in millimeters. Lines indicating indexes 1.30, 1.20, 1.10, 1.00 and 0.90 drawn. Black ball = specimen reared from *Salix lapponum*. Ring= specimens reared from *Salix phylicifolia*. Triangle= specimen reared from *Salix glauca*. Square= other specimens. Abbreviations of localities: Å= Ångermanland, D= Dovre, Fi= southern Finland (associated with galls on *Salix phylicifolia*), Kg= Kälähög, Po= Polarkreis (paratype of *P. lapponicola*), Ra= Rannoch, RM= Riding Mill, SI= Salla, Sn= Saana, Sg= Skalstugan, Vo=Vorderlanerbach (paratype of *Pontania nigricantis*).

**Kuva 1.** Sirontakuviokuva joka osoittaa *Pontania dolichura* lajiryhmän yksilöiden munanasettimen tupen pituuden (oordinaatta) ja takaniilkan pituuden (abscissa) suhteen. Mittakaava millimetreinä. Suorat jotka osoittavat suhteen arvot 1.30, 1.20, 1.10, 1.00 and 0.90 on piirretty kuvioon. Musta pallo = yksilö kasvatettu lapinpajulta (*Salix lapponum*). Rengas = yksilö kasvatettu kiiltopajulta (*Salix phylicifolia*). Kolmio= yksilö kasvatettu tunturipajulta (*Salix glauca*). Neliö= muut yksilöt. Paikkojen lyhenteet: Å= Ångermanland, D= Dovre, Fi= Etelä-Suomi (paikat missä kiiltopajun äkämiä), Kg= Kälähög, Po= Polarkreis (*P. lapponicola* paratyypipi), Ra= Rannoch, RM= Riding Mill, SI= Salla, Sn= Saana, Sg= Skalstugan, Vo=Vorderlanerbach (*Pontania nigricantis* paratyypipi).

the Carpathians, Ukraine. The highest values (ca. 1.01-1.11) were found in an undescribed species reared from *Salix bebbiana* in Magadan oblast, Russia. *Pontania glaucae* has index values between 0.87 and 1.00, the largest value in smallest specimen and lowest value in largest specimen. Some reared specimens can be very small and therefore have a relatively high in-

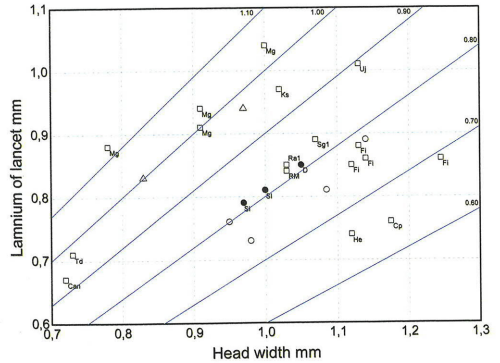


**Fig. 2.** Scatter diagram showing the relationship of the length of ovipositor sheath (ordinate) and head width (abscissa) in specimens of *Pontania dolichura* group. Scale in millimeters. Lines indicating indexes 1.30, 1.20, 1.10, 1.00 and 0.90 drawn. Black ball = specimen reared from *Salix lapponum*. Ring= specimens reared from *Salix phylicifolia*. Triangle= specimen reared from *Salix glauca*. Square= other specimens. Abbreviations of localities: Å= Ångermanland, D= Dovre, Fi= southern Finland (associated with galls on *Salix phylicifolia*), Kg= Kälähög, Po= Polarkreis (paratype of *P. lapponicola*), Ra= Rannoch, RM= Riding Mill, SI= Salla, Sn= Saana, Sg= Skalstugan, Sg1= Skalstugan (lectotype of *Pontania dolichura*), Vo=Vorderlanerbach (paratype of *Pontania nigricantis*).

**Kuva 2.** Sirontakuviokuva joka osoittaa *Pontania dolichura* lajiryhmän yksilöiden munanasettimen tupen pituuden (oordinaatta) ja pään leveyden (abscissa) suhteen. Mittakaava millimetreinä. Suorat jotka osoittavat suhteen arvot 1.30, 1.20, 1.10, 1.00 and 0.90 on piirretty kuvioon. Musta pallo = yksilö kasvatettu lapinpajulta (*Salix lapponum*). Rengas = yksilö kasvatettu kiiltopajulta (*Salix phylicifolia*). Kolmio= yksilö kasvatettu tunturipajulta (*Salix glauca*). Neliö= muut yksilöt. Paikkojen lyhenteet: Å= Ångermanland, D= Dovre, Fi= Etelä-Suomi (paikat missä kiiltopajun äkämiä), Kg= Kälähög, Po= Polarkreis (*P. lapponicola* paratyypipi), Ra= Rannoch, RM= Riding Mill, SI= Salla, Sn= Saana, Sg= Skalstugan, Sg1= Skalstugan (*Pontania dolichura* lektotyypipi), Vo=Vorderlanerbach (*Pontania nigricantis* paratyypipi).

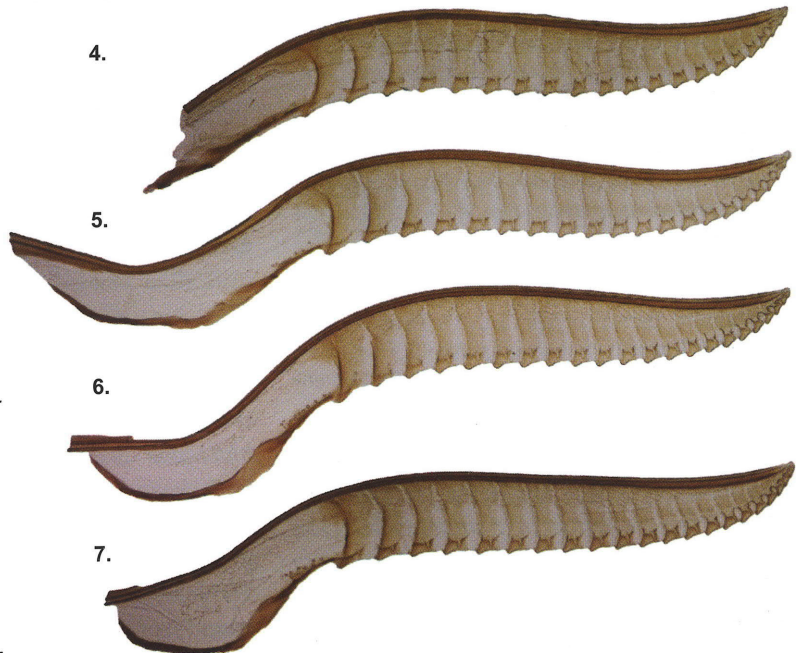
dex (females from Tamokdalen reared on *Salix myrsinifolia* and from Manitoba, Canada reared from *Salix planifolia* Pursh.). The measured few values for specimens reared from or associated in South Finland with *Salix phylicifolia* range from 0.69 to 0.80. The specimens reared

**Fig. 3.** Scatter diagram showing the relationship of the length of lamnium of lancet (ordinate) and head width (abscissa) in specimens of *Pontania dolichura* group. Scale in millimeters. Lines indicating indexes 1.00, 0.90, 0.80, 0.70 and 0.60 drawn. Black ball = specimen reared from *Salix lapponum*. Ring = specimens reared from *Salix phylicifolia*. Triangle = specimens reared from *Salix glauca*. Square = other specimens. Abbreviations of localities: Can= Canada, Manitoba, reared from *Salix planifolia*, Cp= Carpathians, Ukraine, reared from *Salix purpurea*, D= Dovre, Fi= southern Finland (associated with galls on *Salix phylicifolia*), He= Hessen, reared from *Salix purpurea*, Ks= Karesuvanto, *Pontania glaucae*, Mg= Magadan oblast, reared from *Salix bebbiana*, Ra1= Rannoch (lectotype of *Pontania femoralis*), RM= Riding Mill, Si= Salla, Sg1= Skalstugan (lectotype of *Pontania dolichura*), Td= Tamokdalen, reared from *Salix myrsinifolia*, Uj= Utsjoki, *Pontania glaucae*.

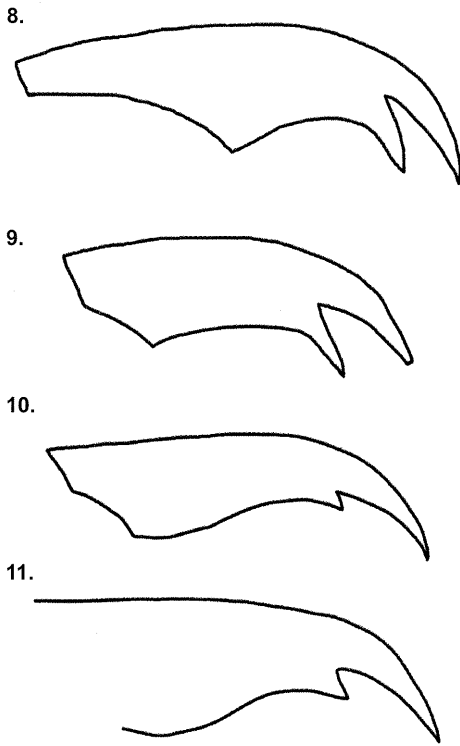


**Kuva 3.** Sirontakuviio joka osoittaa *Pontania dolichura* lajiryhmän yksilöiden sahan lansetin lamniumin pituuden (oordinaatta) ja pään leveyden (abskissa) suhteen. Mittakaava millimetreinä. Suorat jotka osoittavat suhteen arvot 1.00, 0.90, 0.80, 0.70 and 0.60 on piirretty kuvioon. Musta pallo = yksilö kasvatettu lapinpajulta (*Salix lapponum*). Rengas = yksilö kasvatettu kiiltopajulta (*Salix phylicifolia*). Kolmio = yksilö kasvatettu tunturipajulta (*Salix glauca*). Neliö = muut yksilöt. Paikkojen lyhenteet: Can= Canada, Manitoba, kasvatettu pajusta *Salix planifolia*, Cp= Karpaatit, Ukraina, kasvatettu punapajusta (*Salix purpurea*), D= Dovre, Fi= Etelä-Suomi (paikat missä kiiltopajun äkämistä), He= Hessen, kasvatettu punapajusta (*Salix purpurea*), Ks= Karesuvanto, *Pontania glaucae* yksilö, Mg= Magadan oblast, kasvatettu pajusta *Salix bebbiana*, Ra1= Rannoch (*Pontania femoralis* lektotyyppi), RM= Riding Mill, Si= Salla, Sn= Saana, Sg1= Skalstugan (*Pontania dolichura* lektotyyppi), Td= Tamokdalen, kasvatettu mustuvasta pajusta (*Salix myrsinifolia*), Uj= Utsjoki, *Pontania glaucae* yksilö.

**Figs. 4-7.** Photographs of the lancets of species of *Pontania dolichura* group. Fig. 4 (uppermost). *Pontania dolichura* (Thomson), lectotype from Skalstugan. The length of lamnium is 0.90 mm. Fig. 5. *P. dolichura*, female reared from galls on *Salix lapponum* in Dovre. Fig. 6. *P. dolichura*, female reared from galls on *Salix lapponum* in Salla. Fig. 7 (lowermost). *P. femoralis*, female reared from galls on *Salix phylicifolia* in Pudasjärvi.



**Kuvat 4-7.** *Pontania dolichura* -ryhmän lajien sahan lansetin valokuvat. Kuva 4 (ylin). *Pontania dolichura* (Thomson), lektotyyppi. Lamniumin pituus 0.90 mm. Kuva 5. *P. dolichura*, naaras kasvatettu lapinpajun äkämistä Dovreltä. Kuva 6. *P. dolichura*, naaras kasvatettu lapinpajun äkämistä Sallasta. Kuva 7 (alin). *P. dolichura*, naaras kasvatettu kiiltopajun äkämistä Pudasjärveltä.



**Figs. 8-11.** Shape of hind claw in males of *Pontania dolichura* group. Fig. 8 (uppermost). Paralectotype of *Pontania dolichura* (Thomson). Fig. 9. Paratype of *Pontania lapponicola* Kopelke. Fig. 10. Paratype of *Pontania nigricantis* Kopelke. Fig. 11 (lowermost). *Pontania femoralis* (Cameron), male reared from gall on *Salix phylicifolia* in Mäntyharju.

**Kuvat 8-11.** Takakynnen muoto *Pontania dolichura* -ryhmän koirilla. Kuva 8 (ylin): *Pontania dolichura* (Thomson), paraalektotyyppi. Kuva 9: *Pontania lapponicola* Kopelke, paratyyppi. Kuva 10: *Pontania nigricantis* Kopelke, paratyyppi. Kuva 11 (alin): *Pontania femoralis* (Cameron), kasvatettu kiiltopajun (*Salix phylicifolia*) äkämästä Mäntyharjulta.

from *Salix lapponum* have values from ca. 0.80 to 0.88. The lectotype of *Pontania dolichura* gave index value ca. 0.83-0.84. Noteworthy is that also females from Rannoch and Riding Mill gave similar (0.83-0.85) values which are slightly higher than in small specimens reared in Finland from *Salix phylicifolia*.

The lancets in *Pontania dolichura* group have

characteristic form (see fig. 3 in Kopelke (1994)): they are slightly s-shaped, lamnium has about 21-23 segments. In specimens studied for Fig. 3 the number of segments of lamnium of lancet varied from 19-26. The lancets of different species of the group are rather similar, f. ex. Kopelke (1994) hardly used their characters to distinguish between species in his table 3. The photograph of the lancet of the lectotype of *Pontania dolichura* (Thomson) is shown in Fig. 4. If it is compared with figures of lancets in Kopelke (1994: fig. 3), it fits best with lancet of *Pontania dolichura* or *P. lapponicola*. For comparison are shown the photographs of the lancets of a female reared from galls on *Salix lapponum* in Dovre (Fig. 4), of a female reared from galls on *Salix lapponum* in Salla (Fig. 5), and of a female reared from galls on *Salix phylicifolia* in Pudasjärvi (Fig. 6). The lancets of specimens reared from galls on *Salix lapponum* from Dovre (regio alpina) and Salla (lowland bog) look different; former is similar to that of the lectotype of *Pontania dolichura* and the broader teeth of latter are more similar to the teeth of the lancet of *P. helveticae* Kopelke in Kopelke (1994: fig. 3).

Note: The saw of "*Pontania dolichura*" in Benson (1958, fig. 643) has quite different shape and belongs to some species of *Eupontania*.

The male paralectotype of *Nematus dolichurus* has bifid hind claws (Fig. 8), a rather rare character state in males of the species group. Also three males reared from *Salix lapponum* in Dovre have bifid hind claws. The hind claws of the paratype of *Pontania lapponicola* are bifid (Fig. 9).

The hind claws of the males associated with or reared from galls of *Salix phylicifolia* in southern Finland are not bifid but their inner tooth is rather small and does not reach near the apex of claw (Fig. 11), in some males inner tooth is missing totally. The hind claws of the paratype



**Figs. 12-16.** Apex of penis valve in species of *Pontania dolichura* group. Figs. 12-13: Paralectotype of *Pontania dolichura* (Thomson), right and left valve. Figs. 14-15: *Pontania dolichura*, male reared from galls on *Salix lapponum* in Dovre, right and left valve; Fig. 16: *Pontania femoralis* (Cameron), male reared from gall on *Salix phylicifolia* in Mäntyharju, left valve. Scale line 0.1 mm.

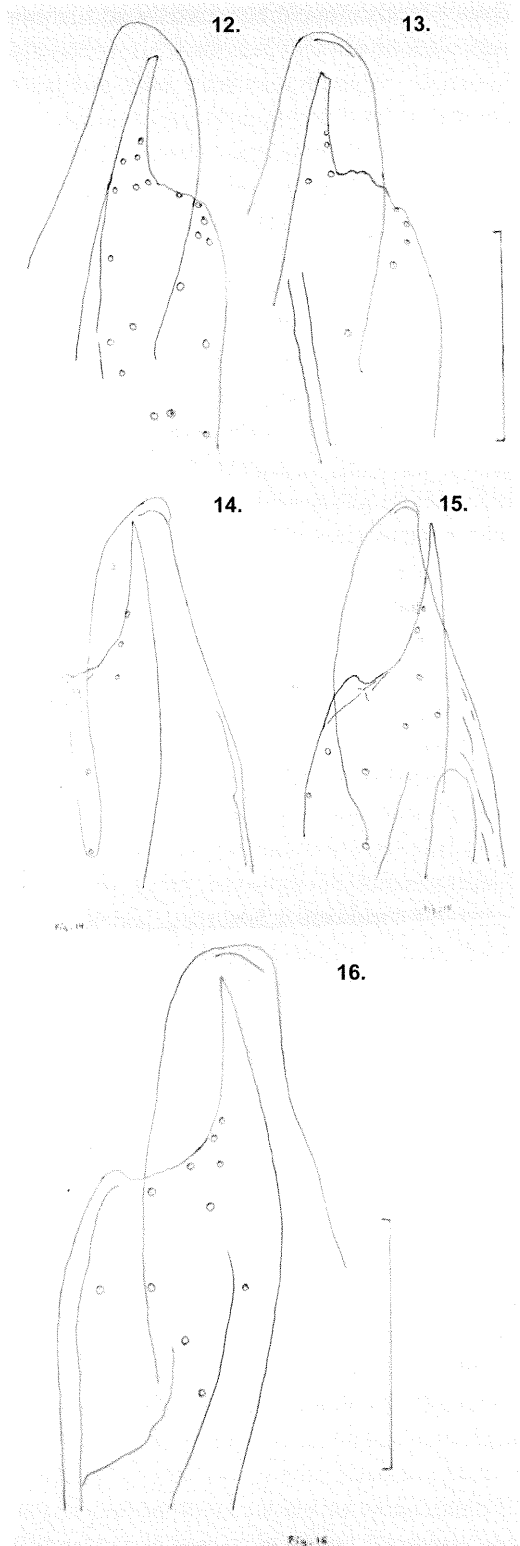
**Kuvat 12-16.** Sukupuolielimen kärki *Pontania dolichura* -ryhmän koirilla. Kuvat 12-13: *Pontania dolichura* (Thomson), paralectotyypin oikea ja vasen valvi. Kuvat 14-15: *Pontania dolichura*, lapinpajun (*Salix lapponum*) äkämästä Dovrelta kasvatettu koiras, oikea ja vasen valvi. Kuva 16: *Pontania femoralis* (Cameron), kasvatettu kiiltopajun (*Salix phylicifolia*) äkämästä Mäntyharjulta. Mittajana 0.1 mm.

of *Pontania nigricantis* have minute inner tooth (Fig. 10)

Kopelke (1994) figured one penis valve of each seven European species of the group and used four different characters of it in his table 3 to separate the species from each other. In fact according to him, beside the galls or host plants, the only real mentioned differences between *P. dolichura* and *P. lapponicola* are two characters of the penis valve, others are variable in one species or the other. Unfortunately the form of penis valve, especially the outline of paravalva (Figs. 12-16) is variable; even in the same specimen right and left penis valve can look different. In the species associated with *Salix phylicifolia*, some reared males (Fig. 16) have angled paravalva as in *P. virilis* or *P. lapponicola* (Kopelke 1994, fig. 4).

As a conclusion of comparison, Kopelke's *Pontania dolichura* (Kopelke 1990, 1994, 1999) is composed of two species: lectotype and paralectotype are not conspecific with the specimens he reared from *S. phylicifolia*. Therefore the lectotype female and paralectotype male specimens in Thomson's collection are redescribed below.

Description of the lectotype of *P. dolichura*:



Head blackish, mandibles basally and labrum yellowish brown. Clypeus dark brown, basally infusate. Supraclypeal area and postocular area brownish. Flagellum brownish black, apical segments more brown. Upper and hind margins of pronotum and prepectus brown, tegula brown, medially slightly infusate. Pterostigma pale brownish, slightly paler basally. Basal 0.7 of hind femur blackish infusate. Hind tibia brownish yellow [and hind tarsus pale according to Thomson]. Emargination of clypeal margin rounded, width 0.18 mm, shallow, extending 0.33 of medial length of clypeus. Tergum 1 with 0-1 setae on each side. Lancet (Fig. 4): radix with a group of 13 pores; lamnium with 21 segments, slightly s-shaped; annulus 2 with 5 ctenidial spines, annulus 3 with 15 ctenidia, from annulus 4 on numerous ctenidia which reach sclerora; two apical segments without ctenidia, nowhere ctenidia reach aulax. Tooth 10 from base with 9-10 small serrulae, with basal fourth distinctly elevated; postcalcar rounded; cypsella comprising apical third, not emarginated.

Measurements of lectotype of *P. dolichura*: Body 4.0, fore wing 4.5, costa 2.7. Head width 1.07, head height 0.75, head length 0.60. Malar space 0.09. Intertorular distance 0.13. Compound eye 0.45 x 0.31. Distance between eyes on frons 0.71, on face 0.69. POL 0.22, OOL 0.23, OD 0.06. Postocellar area 0.15 x 0.34. Flagellomeres 1-7: 0.40 (height 0.10), 0.41, 0.38, 0.31, 0.28, 0.26, 0.33 (height 0.07); total 2.37. Hind femur 1.18, height 0.23. Hind tibia 1.42, apical width 0.16; inner hind spur 0.20, outer spur 0.17. Hind tarsi missing, except one tarsomere 5: 0.24. Hind claw 0.14. Mid-tarsus: tarsomeres 1-4 together: dorsal length 0.64. Ovipositor sheath 1.17. Sawsheath 0.70 x 0.16. Cercus 0.37 x 0.04. Lancet of saw 1.19, lamnium of lancet 0.90.

The characters of the lectotype fit the original description of Thomson, except body length is

larger than 3 mm. Paralectotype females from Skalstugan are smaller, 2.8-3.6 mm long.

Description of paralectotype male of *P. dolichura*: Flagellum brownish. Tegula yellowish brown. Pterostigma brown, hardly paler basally. Hind tibia and tarsus pale brown, not infusate. Clypeus apically roundly emarginated to 0.35 of its medial length. Basal 0.8 of hind femur blackish. Hind claws bifid. Tergum 1 medially with 6-7 setae on either side.

Measurements of paralectotype male: Body 3.6. Fore wing 3.7, costa 2.05. Head width 0.90, head height 0.66, head length 0.51. Malar space 0.07. Intertorular distance 0.10. Compound eye 0.37 x 0.26. Distance between eyes on frons 0.60, on face 0.59. POL 0.23, OOL 0.18, OD 0.06-0.07. Postocellar area 0.10 x 0.31. Flagellomeres 1-7: 0.44 (height 0.12), 0.49, 0.48, 0.38, 0.34, 0.32, 0.37 (height 0.06); total 2.82. Hind femur 1.00, height 0.20. Hind tibia 1.20, apical width 0.15, inner hind spur 0.20, outer spur 0.18. Hind tarsomeres 1-5: 0.40, 0.20, 0.17, 0.09, 0.22; total 1.08. Hind claw 0.10. Hypopygium destroyed, ca. 0.70 x 0.60. Penis valve 0.74.

In the reared specimens of *P. dolichura* from Norway and Finland the colour of tegula of females varies from yellow and brownish yellow to brown, of males from brownish yellow to dark brown. Pterostigma is rather unicoloured, brownish, with base slightly paler. Hind tarsus is pale or brown and hind tibia is not infusate.

3.2. *Pontania femoralis* (Cameron, 1876) (= *Pontania robbinsi* Benson, 1935, an objective synonym). The food plant is *Salix phylicifolia* L.

According to Cameron (1876) the galls of *Nematus femoralis* were found in Rannoch, Scotland in June 1872, and several females and males were reared in 1873. Cameron used

Zaddach's collection name *Nematus femoralis* for the sawfly he reared and described. However, Zaddach never published the name, and thus Cameron is the author of the nominal taxon *Nematus femoralis*. Zaddach in fact used the name for another closely related sawfly which was reared among others on *Salix purpurea* near Danzig by Brischke. This sawfly is currently (starting from Kopelke 1990) known as *Pontania virilis* Zirngiebl, 1955. The larvae in Rannoch lived solitary in galls on a species of *Salix*. The galls were usually in pairs on the leaf placed opposite to and nearly always touching each other, they projected some extent above the upper, but not at all from lower side of the leaf. In form they were usually roundish or oval, and the colour was dark purple or very dark pink above, and green underneath.

The host species of *Salix* was uncertain to Cameron but one friend of his thought that it was probably *S. laurina*. [*Salix x laurina* Sm. 1802 is *S. caprea x phylicifolia* (Hämet-Ahti in Hämet-Ahti et al. 1992) or possibly *S. cinerea* subsp. *oleifolia x phylicifolia* (Karls-son in Jonsell 2000); *S. cinerea* subsp. *oleifolia* Macreight is called as *S. atrocinerea* Brotero in Jalas & Suominen (1976), Argus (1997) and Skvortsov (1999), or *S. acuminata* Miller in Lacourt (1999)]. On 17 July 1875 Cameron again visited Rannoch and found galls of *Nematus femoralis* on *Salix* sp. and on the same willow bushes another and very different gall, of a pale-green colour. It was of about the size of a hazel nut, oval or irregularly roundish in shape, the walls very thin, and the space inside rather large. The size of hazel nut is 1-2 cm; so large and thin walled galls fit only to galls of *Eupontania pustulator* (Forsius) which occur on *Salix phylicifolia* or to galls of *E. vesicator* (Bremi) on *Salix purpurea*. Both species of *Salix* have been mapped from the same UTM grid where Rannoch is situated (Jalas & Suominen 1976).

Later Cameron (1885) wrote about *Nematus*

*femoralis* under the name *Nematus ischnocerus* Thomson (syn. *N. femoralis* Zaddach) and mentioned two food plants for it: *Salix purpurea* and *Salix laurina*. Thus he regarded *S. laurina* as different species from *S. purpurea*. Cameron (1882) figured the galls of *Nematus ischnocerus* and the leaves in figs. 5-5a in plate 5 are broad and fit to *S. phylicifolia* but not to narrow leaves of *S. purpurea*. Benson (1958) did not know galls of *Pontania dolichura* [group] on *Salix purpurea* in Britain, but mentioned them only from C. Europe. Cameron (1885) wrote also on *Nematus vesicator* Bremi. According to him the galls of it are on *Salix helix*, *S. purpurea* and *S. laurina*. He wrote that Rannoch is the only British locality known to him. The gall was figured in fig. 8 in plate 5 (Cameron 1882); the leaf of *Salix* is broad as in *S. phylicifolia*. Benson (1958) synonymized *Nematus vesicator* Cameron, nec Bremi with *Pontania pustulator* Forsius, 1923. In conclusion, according to the information given in Cameron (1876) the food plant of *Nematus femoralis* Cameron is *Salix phylicifolia*, as identified by the sawfly *Eupontania pustulator*. *E. pustulator* is a monophagous species on *Salix phylicifolia* (Forsius 1923, Benson 1935, Kontuniemi 1960, Kopelke 1999, Zinovjev 1999); Vikberg & Zinovjev (2006) recorded it also from closely related *Salix pulchra* in Northern Urals. Benson (1954, 1958) recorded its galls in N. Britain also on *Salix nigricans* (= *S. myrsinifolia*) but this was based on the misidentification of the willow, as assumed by Zinovjev (1999). In Finland all galls of *E. pustulator* occur only on *S. phylicifolia*.

In coll. the Natural History Museum, London there are remains of four specimens of *Pontania dolichura* group which belonged to Cameron's collection and which bear printed label Cameron 96 - 76 and on reverse side of it handwritten "femoralis". It is evident that they belong to syntypes of *Nematus femoralis* Cameron. Obviously these specimens were studied by Benson (1960) when he put an asterisk-mark

before *Pontania femoralis* Cameron; this was a sign for the species of which he had examined the types. The four specimens or their remains fit well to the original description of *Nematus femoralis*. In order to fix the nominal taxon *Nematus femoralis* Cameron the best preserved female in thick micropin is designated hereby as the lectotype of *Nematus femoralis* Cameron; the saw of it (lancets and lances) was mounted in polyviol 17 on a slide; pr. 662 (VV; BMNH). Another female in gelatine capsule (paralectotype) had been dropped away from paper piece on which it was glued on; its saw was studied but found damaged apically. The third female (paralectotype) was glued on paper piece but its body has mostly disappeared. The male (paralectotype) is glued on paper piece. It is in rather good condition except that the apex of abdomen beyond tergum 3 has been cut away. Its hind claws have only minute inner tooth.

The specimens fit rather well to the specimens living in southern Finland on *Salix phylicifolia*, except the ovipositor sheath is slightly longer in relation to the head width (Fig. 2).

R. B. Benson (1935) gave a new name *Pontania robbinsi* nom. n. for *Nematus femoralis* Zaddach, Cameron nec Zaddach and for *N. ischnocerus* C.G. Thomson, Cameron nec C. G. Thomson because he thought that Cameron incorrectly determined them (actually this was so only with *N. ischnocerus*). According to ICZN 1999 Article 72.7 *Nematus femoralis* Cameron and *Pontania robbinsi* Benson are objective synonyms; the lectotype of *Nematus femoralis* is thus also the lectotype of *Pontania robbinsi*. The lectotype for *Pontania robbinsi* Benson which was selected by Quinlan (1974) is invalid because it did not belong to the syntypes of *Nematus femoralis* Cameron nor of *Nematus ischnocerus* Cameron. The lectotype of *Nematus femoralis* belonged also to the syntypes of *Nematus ischnocerus* Cameron, nec Thomson and it serves also as the lectotype

of *Pontania robbinsi* replacing that name. The type locality of *Pontania femoralis* (Cameron) is Rannoch, Perthshire in Scotland according to the original description; the coordinates of Rannoch station are 56°40'N 4°35'W.

Description of the lectotype female of *Nematus femoralis* Cameron: POL/OOL 0.92. Upper hind angle of pronotum and tegula brownish yellow (Cameron wrote: white testaceous). Pterostigma clearly bicoloured (Cameron wrote white testaceous, with apical half fuscous). Basal plate of ovipositor sheath brownish yellow. Hind tarsus blackish.

Measurements of the lectotype female of *P. femoralis*: Body 4.0, fore wing 4.2, costa 2.3. Head width 1.03. Compound eye 0.44 x 0.31. Flagellomeres from base on 0.36 (max. width 0.10), 0.38, 0.35, 0.27, 0.24, 0.24 and 0.27, total 2.11. Hind femur (without trochantellus) 0.97, height 0.225. Hind tibia 1.35, width 0.17, inner hind spur 0.17. Hind tarsomeres from base on 0.42, 0.19, 0.16, 0.08 and 0.25, total 1.10. Sawsheath 0.65, cercus 0.25. Saw: prep. 662 (VV); Lancet of saw 1.07, lamnium of lancet 0.85, lance 1.14.

Characters and measurements of the paralectotype female 1 of *P. femoralis*: Tegula yellow. Body 3.9, head width 0.99. Hind tibia 1.22, width 0.17, inner spur 0.20. Hind tarsus 1.12. Ovipositor sheath 1.12, sawsheath 0.70. Cercus 0.25. Saw: prep. 630 (VV), lance 1.13.

Remains of the paralectotype female 2 of *P. femoralis*: Costa 2.3. Flagellomeres from base on 0.35 (width 0.10), 0.36, 0.34, 0.28, 0.25, 0.25, and 0.29, total 2.12. Hind tarsus 1.15.

The paralectotype male of *P. femoralis*: Tegula brownish black. Pterostigma bicoloured: base whitish, apical half infusate. Coxae and trochanters black. Hind femur almost completely

black. All tarsi strongly infusate. Fore wing 3.8, costa 1.9. Head width 0.90. Flagellomeres from base on 0.42 (width 0.10), 0.46, 0.43, 0.36, 0.33, 0.33, and 0.35, total 2.68. Hind femur (without trochantellus) 0.80, height 0.18. Hind tibia 1.16, width 0.15, inner spur 0.15. Hind tarsomeres from base on 0.40, 0.20, 0.16, 0.08 and 0.20, total 1.04.

Seven females and two males ("paralectotypes" of *Pontania robbinsi* in Quinlan (1974)) from Riding Mill, R. Tyne, Northumberland (labelled wrongly Yorkshire; see also Harrison (1937)), England, ex galls on *Salix phylicifolia*, *Salix andersoniana*, and hybrids, v. 1932, J. Wilkinson leg., were studied from BMNH. They represent the same species as *Nematus femoralis* Cameron.

Characters and measurements of one large female from Riding Mill: Clypeus apically brownish yellow. Corner of pronotum and tegula yellow. Pterostigma bicoloured, with base whitish and apical half infusate. Basal plate brownish yellow. Basal 0.7-0.8 of hind femur infusate, hind tibia brownish yellow and hind tarsus pale, apically brownish infusate. Body 3.9, fore wing 4.2, costa 2.3. Head width 1.03. Compound eye 0.44 x 0.30. Flagellomeres from base on 0.37 (max. width 0.09), 0.36, 0.33, 0.28, 0.25, 0.24 and 0.28, counted up 2.11. Hind femur (without trochantellus) 0.95, height 0.20. Hind tibia 1.25, width 0.15, inner hind spur 0.19. Hind tarsomeres from base on 0.40, 0.19, 0.15, 0.09 and 0.23, total 1.06. Sawsheath 0.62, cercus 0.23. Saw: prep. 663 (VV); lancet 1.02, lamnium of lancet 0.84, lance 1.12.

Characters and measurements of one large male from Riding Mill: Apical margin of clypeus brown. Tegula brownish yellow. Hind trochanter yellow. Basal 0.7 of hind femur blackish, hind tarsus dark, infusate. Body 3.6. Fore wing 3.8, costa 2.3. Head width 1.02. Eye 0.41 x 0.31. Flagellomeres from base on 0.45 (width

0.11), 0.50, 0.47, 0.38, 0.36, 0.35, and 0.36, total 2.87. Hind femur (without trochantellus) 0.92, height 0.19. Hind tibia 1.22, width 0.15, inner spur 0.20. Hind tarsomeres from base on 0.43, 0.20, 0.15, 0.08 and 0.22, total 1.08. Penis valve 0.78: prep. 664 (VV).

Characters of the Finnish specimens of *P. femoralis*: the colour of tegula of female varies from yellow to brown to brownish black or black. Clypeus of female may be brown or black. Hind tarsus is infusate and especially small females have hind tibia apically infusate. Pterostigma is often distinctly bicoloured, much darker apically than whitish base. Interantennal fovea can be rather deep.

3.3. *Pontania nigricantis* Kopelke, 1986 recorded from Finland

The species was described from Tirol, Austria (Kopelke 1986) and later recorded also from Norway and Sweden (Kopelke 1994, 1999). Silfverberg (1996) added it to Finnish fauna on the basis of Kopelke (1994). However, galls on *Salix myrsinifolia* have not been recorded from Finland either by Vikberg (1970) or Kopelke (1994). This is done for the first time here: in August 1997 some 5-10 galls were found on *Salix myrsinifolia* in Enontekiö Lapland, Saana, regio subalpina by Alexey Zinovjev, and in August 2000 two galls were found near the Biological station, University of Helsinki, Kilpisjärvi by author VV.

One small reared female was examined from Norway, Tromsø, Balsfjord, Tamokdalen, near Tamok-fjellet, the galls were collected on 16 August, 1989 on *Salix myrsinifolia* (?ssp. borealis) by VV. At the same locality there were galls of *P. dolichura* group also on *Salix phylicifolia* and *lapponum*. Several males and females were reared from the galls on *S. myrsinifolia* in Norway, Tromsø, Skibotndalen, Brenn fjellet collected on 13 and 15 June 2003 by VV.

Note. In June 2000 galls of *P. dolichura* group were found on *S. myrsinifolia* and *S. phylicifolia* in Central Sweden: Västmanland, Hällefors (Anders Albrecht, pers. comm.).

## Acknowledgements

It is our pleasant duty to thank all curators of Zoological museums mentioned in Material and methods for loans of types and other specimens. Without their help this work could not be performed. Alexey Zinovjev, Randolph, USA presented us with some specimens reared in Canada, Russia and Ukraine, and he and Anders Albrecht, Helsinki informed us on galls they have found in Finland and Sweden. Andrew Liston, SDEI Müncheberg, carefully read the first draft of the manuscript and corrected the English language.

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