Revision of the Histopona italica group (Araneae: Agelenidae), with the description of two new species

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Abstract

During a large survey of agelenid spiders from different private and museum collections, a closer examination of material from all over Italy (including type material) previously identified as *H. italica* Brignoli, disclosed two new species for science, both belonging to the *italica* group. Based on the results of the present work, we describe *Histopona leonardoi* sp. n. and *H. fioni* sp. n. and revise the distribution pattern of *H. italica* group in Italy and Switzerland. Drawings and photographs of relevant structures and a summary of diagnostic characters, allowing a fast separation of the species, are provided.

Keywords

Taxonomy, endemic fauna, biogeography, Alps, Apennines.

Introduction

According to Platnick (2012) the genus *Histopona* Thorell 1869 currently includes 18 valid species, two of them, *H. krivosijana* (Kratochvíl) and *H. paleolithica* (Brignoli) with undescribed males. In her revision of the genus Deeleman-Reinhold (1983) treated 17 of those species, grouping them into five species groups based on morphological characters. Weiss & Rusdea (1998) identified the previously unknown male of *Histopona laeta* (Kulczynski) and revalidated that species. Some years later, Gasparo (2005) described a new species from Greece, *H. thaleri* Gasparo, adding some detailed taxonomical information and placing it in the *myops* group.

The phylogenetic position of *Histopona* within the family Agelenidae is still unclear. Based on morphological characters, the genus is probably a sister taxa of *Tegenaria* Latreille (Bolzern, unpublished data).

Most representatives of the genus are distributed in Southeastern Europe. Only *H. torpida* has a wider range of distribution, reaching central Europe and Russia. During a larger survey of agelenid spiders from different private and museum collections, a close examination of material from all over Italy (including type material) previously identified as *H. italica* Brignoli, disclosed two new species for science, both belonging to the *italica* group (sensu Deeleman-Reinhold 1983). Based on the results of the present work, we describe the two new species and revise the distribution pattern of the *H. italica* group.

The descriptions are based on detailed examination of morphological characters of genital structures which were found as discrete, allowing a clear separation of the species. Drawings and photographs of relevant structures and a summary of diagnostic characters, allowing a fast separation of the species, are provided.

Methods

The examined specimens are preserved in 70 % ethanol. Specimens are deposited at Museo Civico di Scienze Naturali “E. Caffi” di Bergamo, except when explicitly noted as being from one of the following: (NMB: Naturhistorisches Museum Basel; MSNVR: Museo di Storia Naturale di Verona; CG: private collections of Fulvio Gasparo; CI: private collection of Marco Isaia).

For the morphological examination and the preparation of drawings, a Leica Stereomicroscope MZ12 (up to 110 x magnification) and MZ Apo with drawing tube were used. Most measurements were taken from digital pictures made with a Leica DFC320 camera and calculated with the program ImageJ 1.38x (http://rsb.info.nih.gov/ij/). Photographs were stacked using the program CombineZM (http://hadleyweb.pwp.blueyonder.co.uk/CZM/News.htm) and processed with Adobe Photoshop and Illustrator. For clearing the vulva, the dissected epigyne was placed into clove oil for several minutes. The descriptions of the bulb are given from a ventral view. Leg measurements were taken from the dorsal side. All measurements are given in millimetres. The color description is based on ethanol preserved specimens. The nomenclature of morphological structures follows Jocqué & Dippenaar-Schoeman (2006) and Bolzern *et al*. (2008, 2010).

The following abbreviations are used: AER = anterior eye row; ALE = anterior lateral eyes; AME = anterior median eyes; ALS = anterior lateral spinnerets; CO = copulatory opening; FD = fertilization duct; latCD = lateral lobe of the copulatory duct; PMS = posterior median spinnerets; PER = posterior eye row; PLA = posterior lateral eyes; PME = posterior median eyes; PLS = posterior lateral spinnerets; RTA = retrolateral tibial apophysis (used here as the sum of all structures in retrolateral position of the tibia of the male pedipalp); RTAd = dorsal branch of RTA; RTAl = lateral branch of RTA; RTAv = ventral branch of RTA; RC = receptaculum.

The toponomastics and classification of the different sectors and sub-sectors of the Alps follows the recent partition of the Alpine chain (SOIUSA: Marazzi 2005). Material is listed in geographical order (North to South, West to East).

Taxonomy

Family Agelenidae C. L. Koch 1837

***Histopona italica* Brignoli 1977**

Figures 1–2; 13–14; 21–22; 27

H. i. Brignoli, 1977: 35, f. 14-15, 17–18 (Df, m misidentified = *H. leonardoi* **sp. n.**).

H. i. Deeleman-Reinhold, 1983: 336, f. 18–19 (f).

H. i. Hänggi, 1990: 163, f. 21a-b (m misidentified = *H. fioni* **sp. n.**, f misidentified).

H. i. Trotta, 2005: 160, f. 193-194 (m misidentified = *H. fioni* **sp. n.**, f misidentified).

Type material

Holotype female: **ITALY: Lazio**: Roma: Colli Albani, Monte Cavo, 1f# 5/V/1968, Brignoli P.M. (MSNVR).

Paratypes: ITALY: **Piemonte**: Cuneo: Maritime Alps, Val Pesio, Small lakes of Marguareis, 2100 m, 2f# 7/1968, Osella G. (MSNVR); **Toscana**: Firenze: Borgo San Lorenzo, Polcanto, 1f# 11/III/1972, Magini F. (MSNVR); **Marche**: Pesaro: Apecchio, Serra Val di Carda, 1m#, 1f# 11/IV/1971, Bianchi R.; **Lazio**: Rieti: Amatrice, Monti della Laga, Capricchia, 1150-1300 m, 1f# IX/1968, Osella G. (MSNVR); **Molise**: Campobasso: Bojano, 500-700 m, 1f# 18/IX/1967, Minelli A. (MSNVR); Matese, Piani di Campitello, 1500 m, 1f# 22/IX/1967, Minelli A. (MSNVR); Isernia: Roccamandolfi, 820 m, 2f# 29/VI/1967, Riggio, Osella G. (MSNVR).

Other material examined

ITALY: Piemonte: Cuneo: Garessio, riparian wood 600 m, 1m#, 1f#, 10/IV/2004, Beikes S.; **Liguria**: Genova: Mezzanego, Ghiaiette, beech wood 850 m, 1m#, 2f#, 31/X/2009-25/V/2010, 12f# 25/V-18/VIII/2010, Lodovici O., Pantini P., Valle M.; Mezzanego, Forest of Monte Zatta, c/o ex. Colonia Devoto, beech wood 1050 m, 5m#, 4 f#, 31/X/ 2009-25/V/2010, Lodovici O., Pantini P., Valle M. (NMB), 1m# 4f# 25/V-18/VIII/2010, 2f# 25/V/2010 Lodovici O., Pantini P.; Propata, Monte Cremado, 1460 m, 2m# 2/V-5/VI/1998, Cartasegna F., Pesce D. (CG); La Spezia: Varese Ligure, Passo Cento Croci, 1000 m, 2 m#, 1 f# IV-VIII/1991, Cerbino R., Valle M., 1m#, 1f# IX/1991-V/1992, Buttarelli G., Cerbino R., Pantini P., Valle M., 1m#, 2f# VI-IX/1992, Pantini P., Valle M.; Savona: Bormida, SP 15 for Colla Melogno, small stream 670 m, 1f# 28/V/2001; Calizzano, Colle del Melogno, 1000 m, 2f#, 13/VI-12/VII/1999, Trotta A. (CG); Calizzano, Colla Melogno, beech wood 920 m, 1f# 28/V-17/VII/2001, 3f# 18/7-10/X/2001; Calizzano, Rio dell'Uscio, 990 m, 1f# 13/VI-12/VII/1999, Trotta A.; Sassello, Rio del Nido, beech wood 1000m, 4m#, 1 f#, 18/VII-10/X/2001; **Emilia Romagna**: Parma: Bedonia, Passo di Montevacà, 800 m, 2m# IV-VIII/1991, Cerbino R., Valle M., 4m# IX/1991-V/1992, Buttarelli G., Cerbino R., Pantini P., Valle M., 3m#, 2f# XI/1992-IV/1993, Pantini P., Valle M.; Corniglio, Lagdei, fir wood 1320 m, 9 m#, 15/VII-7/X/1997, Fabbri R.; Tornolo, Tarsogno, 800 m, 1m#, 1f# IV-VIII /1991, Cerbino R., Valle M., 1m# IX/1991-V/1992, Buttarelli G., Cerbino R., Pantini P., Valle M., 2f# 25/X/1992, Valle M., 2m#, 3f# 1994, Pantini P., Valle M.; Piacenza: Bobbio, Passo Penice, wood 1100 m, 1m#, 8f# 20/V-20/VI/2001 (1f# NMB: 20668) , Pantini P., 2f# 20/VI-31/VII/2001, Pantini

P., 13m#, 8f# 19/IX/2001-20/III/2002 Pantini P. (7m#, 6f# NMB), 2f# 26/IV-27/VI/2002, Pantini P.; Bobbio, road for Monte Penice, road margin 1400 m, 1f# 31/VII-19/IX/2001, Pantini P. (NMB), 1m# 19/IX/2001-20/III/2002; Modena: Guiglia, cave "Buco dell'Albero, ER-Mo 267", 585 m, 1f# 9/X/2000; **Toscana**: Firenze: Marradi, Badia Valle, 430 m, 1f# 23/IV/2003, Usvelli A.; Pistoia: Abetone, botanical garden "Le Regine", 1275 m, 2f# 2-29/VI/2003, Colombetta G. (CG); **Marche**: Ascoli Piceno: Montemonaco, Isola San Biagio, mown meadow 990 m, 7f# 23/VI-27/VII/2004, 1 m#, 2 f#, 1/IX-7/X/2004, Rismondo M., Fabbri R.; Macerata: Fiuminata, road to Passo Cornello, 600 m, 1m#, 1f# VI-XII/1991, Buttarelli G., Ghilardi E., Pantini P. Valle M.; Sarnano, Colle, mixed broadleaved wood 550 m, 2f# 1/IX-7/X/2004, Rismondo M., Fabbri R.; Pesaro: Piobbico, Monte Nerone, 1300 m, 1 m#, 18/IX/1992, Pantini P., Valle M.; **Umbria**: Perugia: Nocera Umbra, Colle Aprico, slope of Monte Pennino, 700 m, 6m# VI-XII /1991, Buttarelli G., Ghilardi E., Pantini P. Valle M., 1f# I-VI/1992, 1m#, 1f# VI-IX/1992, Pantini P., Valle M., 3f# 14/VI/1992, Buttarelli G., Pantini P. Valle M.; San Giustino, Monte Moriccio, 900 m, 5m# VI-XII/1991, 1f# I-VI/1992, 2m#, 2f# VI-IX/1992, 1f# IX/1992- VI/1993, Pantini P., Valle M.; 2f# San Giustino, Parnacciano, 700 m, 19 m#, 6 f# VI-XII/1991, Buttarelli G., Ghilardi E., Pantini P. Valle M., 2f# 13/VI/1992, 4m#, 4f# VI-IX/1992, Pantini P., Valle M.; Sigillo, Piani di Monte, 1200 m, 3 m#, 1 f#, VI-XII/1991, Buttarelli G., Ghilardi E., Pantini P. Valle M., 3m# I-VI/1992, 1m# VI-IX/1992, Pantini P., Valle M.; **Lazio**: Frosinone: Guancino, Vermicaro, Cave "Gnomo gnomo", 1 m#, 4/X/2003, Baroncini G.; Roma: Subiaco, Monti Simbruini, Campo Buffone, 6f# 28/VII/2009, La Casella F.; **Abruzzo**: Pescara: Carpineto della Nora: Gran Sasso, Voltigno, beech wood 1550 m, 1m# 12/X/2001, Marotta O., 2m# 4/X/2002, Marotta O., Zuppa A.M.; Teramo: Isola del Gran Sasso d'Italia, Gran Sasso, towards Lake of Pagliara, mixed broadleaved wood 900 m, 1m# 3/X/2002, Marotta O., Carissimi D., 1m# 26/X/2002, Marotta O., Matin K., 1m# 7/X/2003, Marotta O.; Rocca Santa Maria, Monti della Laga, Ceppo, Pietralta, fir wood, 4 m#, 1f# 28/X/2001, Marotta O.; Rocca Santa Maria, Monti della Laga, Ceppo, road to Acquamorta, fir wood 1450 m, 5m#, 3f# 6/X/2002, 11 m#, 5f# 4/IX/2003, 8m# 7/X/2003, Marotta O.; Rocca Santa Maria, Monti della Laga, Ceppo, towards Lago dell'Orso, beech wood 1650 m, 1m# 13/III/2002, Marotta O., Zuppa A.M., 3m# 6/X/2002, Marotta O.; Tossicia, Gran Sasso, Tozzanella, on the way to Colle Pelato, fir wood 1050 m, 6m# 18/XI/2001, Marotta O., Matin K., 1f# 27/VIII/2002, Marotta O., Di Marco C., 9m# 3/X/2002, Marotta O., Carissimi D., 5m# 26/X/2001, Marotta O., Matin K.; Valle Castellana, Monti della Laga, Ceraso, mixed wood 655-850 m, 18 f#, 25/VII/2001, Marotta O., Zuppa A.M., 1m# 6/X/2001, 3m#, 2f# 28/X/2001, 1f# 7/VIII/2003 Marotta O.;

Basilicata: Potenza: San Severino Lucano, Santuario Madonna del Pollino15m#, 2f# VI/1989-V/1990, Valle M., 8m#, 7f# VI/1990-VI/1991, Buttarelli G., Ghilardi E., Pantini P., Valle M., 1m#, 1f# 1992, Pantini P., Valle M.; Viggianello, Piani di Ruggio, 1f# VI-VIII/1989, 9 m#, 3 f#, IX/1989-V/1990, Valle M.; Viggianello, Visitone, 2m# IX/1989-V/1990, Valle M.; **Calabria**: Cosenza: Fagnano Castello, Lago Trifoglietti, 1050 m, 1m# 24/VIII/2008; Reggio Calabria: Santo Stefano d'Aspromonte, 800 m, 1m# 24/V/1990, Valle M.; Santo Stefano d'Aspromonte, Gambarie, 1300 m, 2 m#, VI/1990-VI/1991, Buttarelli G., Ghilardi E., Pantini P., Valle M.; Santo Stefano d'Aspromonte, tra Gambarie e Montalto, 1500 m, 3 f# IX/1989-V/1990, Valle M. 1f# VI/1990-VI/1991, Buttarelli G., Ghilardi E., Pantini P. Valle M. **REPUBLIC OF SAN MARINO:** Castello di Chiesanuova: Fosso di Canepa, 250 m, 2f# 12/VII-11/VIII/2010, Fabbri R.; Mulini, Fosso di Canepa, wood 300 m, 5f# 28/IV-25/V/2010, 7f# 13/VII-25/VIII/2010, Fabbri R.

Diagnosis

Males (Figures 1-2,13-14) can be separated by the absence of a patellar apophysis (present in *torpida* group, except *H. vignai*), the plate-like and distally bifid elongated radix (absent in *myops*- and *strinatii* group, distally spoon-like in *H. leonardoi* sp. n., tube-like in *H. fioni* sp. n.) and the distally broadly rounded conductor (strongly elongated in *H. fioni* sp. n.). Females (Figures 21-22, 27) can be separated from other *Histopona* species by the glossy median indented posterior epigynal sclerite (much longer and with anterior margin only moderately indented in *torpida* group) with parallel margin (moderately diverging in *H. leonardoi* sp. n., strongly diverging in *H. fioni* sp. n., the unpaired "bursa copulatrix" (completely paired copulatory ducts in *myops*- and *strinatii* group) with anterior margin straight or convex (concave in *H. leonardoi* sp. n., v-shaped in *H. fioni* sp. n.) and the broad lateral lobes of the copulatory ducts (narrow in *H. leonardoi* sp. n.). See also Table 1.

Description

Measurements of male (n=1, paratype from Apecchio): carapace 2.95 long, 2.21 wide. Head region 1.06 wide; PER 0.64 wide. Chelicerae 1.24 long, 0.54 wide. Labium as long as wide or moderately wider than long. Gnathocoxa ratio width to length: 0.56. Sternum 1.55 long, 1.30 wide. Opisthosoma 2.28 long, 1.93 wide. Ratio bulb length (laterally from cymbium base to conductor tip) to cymbium length: 0.801. Leg measurements are reported in Table 2.

Measurements of female (n=1, paratype from Apecchio): carapace 2.95 long, 2.01 wide. Head region 1.10 wide; PER 0.66 wide. Chelicerae 1.25 long, 0.54 wide. Labium as long as wide or

moderately wider than long. Gnathocoxa ratio width to length: 0.536. Sternum 1.52 long. 1.3 wide. Opisthosoma 3.33 long. 2.2 wide. Epigynal plate 1.01 long. 1.08 wide; atrium 0.23 long. 0.84 wide. Leg measurements are given in Table 2.

Eyes: in dorsal view both eye rows straight or slightly recurved; in frontal view AER and PER procurved, AER may be almost straight. Diameters: PME: 0.137–0.145; PLE: 0.143–0.145; AME: 0.084–0.086; ALE: 0.148–0.154. Distances: PME–PME about half diameter of PME or less; PME–AME less than diameter of PME; PME–PLE about half diameter of PME or slightly less; PME–ALE less than diameter of PME; AME–AME about half diameter of AME or slightly less; AME–ALE less than half diameter of AME. Clypeus height (measured under AME) less than or equal to 3 diameter of AME; clypeus height (measured under ALE) less than or equal to 1.5 diameter of ALE.

Coloration: carapace with broad, continuous dark margin; two longitudinal symmetrical darkened bands present on carapace; head region median with narrow dark band. Sternum without coloration pattern. Opisthosoma dark grey green; cardiac mark moderately pronounced; posteriorly with indistinct pattern of chevrons. Legs without coloration pattern.

Additional somatic characters: distal margin of labium straight or moderately concave. Plumose hairs present on carapace, legs and opisthosoma. Three promarginal teeth, the most proximal smallest; 5–6 retromarginal teeth, decreasing in size proximally. All trochanters notched. Tarsi I and IV with 7–8, tarsi II and III with 6–7 dorsal trichobothria. No trichobothria on palp tarsi or cymbium. Pale colulus divided into two separated plates, sometimes only recognizable as two hairy regions. PLS longer than all others with distal segment as long as basal segment; both darkened. PMS as long as ALS. ALS moderately darkened. The formulae of leg spination are listed in Table 3.

Male palp (Figures 1–2, 13–14): RTA with a large dorsal branch, distally pointed, strongly sclerotized and moderately stepped; lateral branch forming moderately sclerotized finger-shaped appendix; ventral branch forming rounded bulge-like appendix, protruding ventrodistally. Tegulum broad ring-shaped, distally dividing into a filiform embolus and a plate-like apophysis (radix) distally divided into a pointed and a more rounded projection. Embolus originating (free apex) at 11 o'clock position, distal tip between 2 and 3 o'clock position. Conductor lamella-like, distally broadly rounded and moderately elongated, laterally folded along the whole length; shorter than alveolus, distally reaching at least to alveolus margin; terminal end forming moderately sclerotized peak. Connection of conductor and tegulum membranous, band-like. Median apophysis and tegular apophysis absent.

Epigynum and vulva (Figures 21–22, 27): epigynal plate sclerotized, rectangular, posterior with distinct atrium; atrium anteriorly limited by strongly sclerotized, m-shaped margin of the epigynal plate with a posteriorly tapered median region; atrium posteriorly limited by a glossy sclerite ("epigynal valve"), median deeply indented with almost parallel margins; between anterior margin and posterior sclerite atrium covered by membranous white cuticula. Copulatory openings located at anteriolateral border of atrium. Copulatory duct first unpaired ("bursa copulatrix"), anteriorly straight or convex, then dividing into broad paired lateral lobes directing into strongly sclerotised convoluted receptacula; fertilization ducts very short.

Distribution: Italy, from Maritime Alps to Aspromonte along the whole Apenninic chain.

Ecology: Records of *H. italica* treated here mostly refer to forest habitat (beech, mixed broadleaved and fir woods), The species occurs more rarely in mown meadows and caves. Elevation ranges from 250 (San Marino) to 1600 m (Abruzzo). Adults occur all over the year.

***Histopona fioni* sp. n.**

Figures 3–6, 11, 15–16, 23–24, 28.

H. italica Hänggi, 1990: 163, f. 21a (m misidentified).

H. italica Trotta, 2005: 160, f. 193 (m misidentified).

Type material

Holotype male: **SWITZERLAND: Tessin:** Bustorgna, Mte. S. Giorgio, m#, 18/IX-3/X/1989, Hänggi A. (NMB: 2488 a; Hänggi 1992 sub *H. italica*).

Paratypes: **SWITZERLAND: Tessin:** Bustorgna, M.te S. Giorgio, 3m#, 18/IX-3/X/1989, Hänggi A. (NMB: 20673; Hänggi 1992 sub *H. italica*); Paruscera, M.te S. Giorgio, 1m#, 28/IX/1988, Hänggi A. (NMB: 2488 c; Hänggi 1992 sub *H. italica*); Mte. Generoso, Pree, 2m#, 5/IX/1989, Hänggi A. (NMB: 2488 b; Hänggi 1992 sub *H. italica*); V. di Scareglia, m#, 12/X/2005, Vicentini (NMB: 2488 e). **ITALY: Trentino-Alto Adige:** Trento: Arco, Monte Biaina, Western slope, locality Gorghi, 1200 m, 2f# 13/VII/1998, Vailati D.; Concei, Val Concei, Gaverdina, 1500 m, 1m# 4/X/1986, Vailati D.; Condino, Monte Stigolo, 1550 m, 2f# 12/XI/1997, Vailati D.; Rovereto, Cengio Rosso, 450 m, 1f# 21/XI/1992, Vailati D.; Storo, Val d'Ampola, 650 m, 1f# 5/V/1993, Vailati D.; **Lombardia**: Bergamo: Ardesio, Valcanale, locality Braghina, 830 m, 1f# 14/IV-18/V/2010, Zucchelli W.; Averara, Alpe Cul, alpine

pasture 1990 m, 2m# 13/VIII-26/IX/2002, 1f# 23/V-20/VII/2003, 1f# 20/VII-23/VIII/2003, 1f# 19/X/2003-5/VI/2004, Lodovici O., Pantini P. (Isaia *et al* 2007 sub *H. italica*); Camerata Cornello, Monte Cancervo, rocky area 1800 m, 1m# 23/VII-27/VIII/2010, 1m# 27/VIII-7/X/2010, Massaro M., Zucchelli W.; Camerata Cornello, Monte Venturosa, rocky area 1850 m, 2m# 10/VIII-9/IX/2009, 1m# 23/VII-27/VIII/2010, Massaro M., Zucchelli W.; Camerata Cornello, Monte Venturosa, pasture 1800 m, 3m# 23/VII-27/VIII/2010, 1m# 27/VIII-27/X/2010, Massaro M., Zucchelli W.; Camerata Cornello, Buffalora, beech wood 1100 m, 1f# 15/VII-10/VIII/2009, Massaro M., Zucchelli W.; Camerata Cornello, Buffalora, bushy area in beech wood 1150 m, 3m# 4/VI-14/VII/2009, 1m# 10/VIII-9/IX/2009, Massaro M., Zucchelli W.; Colzate, Baite Sedernello, 1200 m, 1f# 17/VII/1988, Ravazzi C., Valle M. (Isaia *et al* 2007 sub *H. italica*), 1m# 2/VIII/2001, Ferrario E., Pantini P., Pellizzoli E., Valle M.; Monasterolo del Castello, Val Torrezzo, wood 600 m, 1f# 6/VII-3/VIII/1995, 1m# 19/IX-26/X/1995, 1f# 9/V-19/VI/1996, Pantini P., Valle M. (Pantini 2000 sub *H. italica*); Oneta, slopes of Monte Alben, 2f# 13/VI/1990 Valle M. (Isaia *et al* 2007 sub *H. italica*); Parzanica, Valle dei Foppi, wood 550 m, 2 m# 10/VIII-19/IX/1995, 2 f# 9/5-19/VI/1996, Pantini P., Valle M. (Pantini 2000 sub *H. italica*); Premolo, in doline, South of B. ta Camplano, 1850 m, 1m# 22/VII-1/X/2003 (Isaia *et al* 2007 sub *H. italica*); Premolo, rocky area 1850 m, 1m# 19/VI-22/VII/2003, 1f#1/X/2003-7/VII/2004, 1m# 4/VIII-29/IX/2004, 1f# 21/VI-21/VII/2005 (Isaia *et al* 2007 sub *H. italica*); Schilpario, road to Passo Campelli, moraine 1750 m, 1f# 6/VI-26/VI/2007; Serina, Valpiana, 1m# IV-V/1988, 1m# 1988, Becci B., Pisoni R. (Isaia *et al* 2007 sub *H. italica*); Valgoglio, Val Sanguigno, beech and fir mixed wood 1000 m, 1m#, 2f# 11/VI-15/VII/2009 (MSNVR), 4m# 15/VII-11/VIII/2009, 4m# 11/VIII-15/IX/2009, 2m# 6/VII-7/VIII/2010, 4m# 7/VIII-15/IX/2010, Massaro M., Zucchelli W.; Vigolo, Ronchi della Bratta, spruce wood 850 m, 1f# 18/VII-10/VIII/1995, 8m# 10/VIII-19/IX/1995, 3m#, 1f# 19/IX-26/X/1995, 3f# 26/X/1995-20/II/1996, 2m#, 7f# 20/II-2/IV/1996, 7m#, 3f# 9/V-19/VI/1996, 2f# 19/VI-8/VIII/1996, Pantini P., Valle M. (Pantini 2000 sub *H. italica*); Lecco: Casargo, Val Marcia, wood 1000 m, 8m# 25/VI-11/IX/2008 Massaro M., Zucchelli W.; Casargo, Val Foppone, alpine pasture 1600-1750 m, 1m#, 1f# 25/VI-11/IX/2008, 1m# 13/VIII-14/IX/2009, Massaro M., Zucchelli W.; Pagnona, road to Alpe Vesina, beech wood 1400-1430 m, 1f# 26/III-1/V/1999, 2m#, 1f# 1/V-9/VI/1999, 3f# 9/VI-6/VII/1999, 1m#, 2f# 6/VII-11/VIII/1999, 1m# 11/VIII-8/IX/1999, Pantini P. (Isaia *et al* 2007 sub *H. italica*); Vendrogno, Mornico, chestnut wood 970 m, 2f# 14/IV-13/V/1999, 1m# 13/V-9/VI/1999, 1f# 9/VI-6/VII/1999, 1m#, 2f# 6/VII-11/VIII/1999, Pantini P. (Isaia *et al* 2007 sub *H. italica*).

Other material examined

SWITZERLAND: Tessin: Bustorgna, Mte. S. Giorgio, 3m#, 5-18/IX/1989, 3-30/X/1989, Hänggi A. (NMB: 20674-20675; Hänggi 1992 sub *H. italica*); Forello, Mte. S. Giorgio, 1m#, 05-18/IX/1989, Hänggi A. (NMB: 20679; Hänggi 1992 sub *H. italica*); Mte. Generoso, Pree, 3m#, 30/VII-12/VIII/1988, 25/VIII-5/IX/1989,18/IX-7/X/1989, Hänggi A. (NMB: 20676-20678; Hänggi 1992 sub *H. italica*); **ITALY: Lombardia:** Bergamo: Entratico, I Moi, 1 m# (paratype of *Histopona italica*, misidentification), 5/IV/1957, Bonino.

Etymology: The species is dedicated to Fion Bolzern, firstborn of AB. The species epithet is a name in apposition.

Diagnosis

Males (Figures 3–6, 15) can be separated by the absence of a patellar apophysis (present in *torpida*-group, except *H. vignai*), the distally tube-like elongated radix (absent in *myops*- and *strinatii*-group, plate-like and distally bifid in *H. italica*) and the distally strongly elongated conductor (broadly rounded in *H. italica*). Females (Figures 23-24, 28) can be separated from other *Histopona* species by the glossy median indented posterior epigynal sclerite (much longer and with anterior margin only moderately indented in *torpida*-group) with strongly diverging margin (parallel in *H. italica*), the unpaired "bursa copulatrix" (completely paired copulatory ducts in *myops*- and *strinatii*-group) with anterior margin v-shaped (straight or convex in *H. italica*) and the narrow lateral lobes of the copulatory ducts (broad in *H. italica*). See also Table 1.

Description

Measurements and ratios of male (n=2, holotype male and paratype male from Pagnona*):* carapace 2.93–3.27 long, 2.20–2.42 wide. Head region 1.17–1.29 wide; PER 0.61–0.78 wide. Chelicerae 1.35–1.44 long, 0.54–0.58 wide. Labium as long as wide or moderately wider than long. Gnathocoxa ratio width to length: 0.510–0.571. Sternum 1.54–1.73 long, 1.27–1.46 wide. Opisthosoma 2.96–3.75 long, 1.85–2.15 wide. Ratio bulb length (laterally from cymbium base to conductor tip) to cymbium length: 0.79–0.80. Leg measurements are given in Table 2.

Measurements of females (n=2, paratypes from Pagnona and Rovereto*):* carapace 3.03–3.33 long, 1.95–2.24 wide. Head region 1.22–1.33 wide; PER 0.59–0.75 wide. Chelicerae 1.54 long, 0.68–0.69 wide. Labium moderately wider than long. Gnathocoxa ratio width to length:

0.62–0.64. Sternum 1.57–1.69 long, 1.25–1.40 wide. Opisthosoma 3.50–3.73 long, 2.27–2.42 wide. Epigynal plate 0.98–1.04 long, 1.04–1.10 wide; atrium 0.24–0.26 long, 0.89–0.98 wide. Receptaculum 0.19 wide. Leg measurements are given in Table 2.

Eyes: in dorsal view both eye rows straight or slightly recurved; in frontal view AER straight and PER procurved (Figures 9–10). Diameters: PME: 0.105–0.124; PLE: 0.105–0.143; AME: 0.060–0.086; ALE: 0.110–0.124. Distances: PME–PME equal diameter of PME; PME–AME less than diameter of PME; PME–PLE less than diameter of PME; PME–ALE equal diameter of PME or slightly less; AME–AME 0.5–1.0 times diameter of AME; AME–ALE about half diameter of AME. Clypeus height (measured under AME) about 2.5–3.5 times diameters of AME; clypeus height (measured under ALE) about 1.5–2 times diameters of ALE.

Coloration: carapace with indistinct pattern only or not darkened. Sternum without coloration pattern. Opisthosoma dark grey green; cardiac mark moderately pronounced; posteriorly without pattern. Legs without color pattern.

Additional somatic characters: distal margin of labium concave. Plumose hairs present on carapace, legs and opisthosoma. Three promarginal teeth, the second one from proximal biggest; 5–6 retromarginal teeth, all equal in size (Figure 11). All trochanters notched. Tarsi I, II and IV with 7–8 dorsal trichobothria and 6–7 on tarsus III. No trichobothria on palp tarsi or cymbium. Colulus moderately divided into two separated plates, sometimes only recognizable as two hairy regions. PLS longer than all others with distal segment as long as or slightly longer than basal segment, both pale. PMS as long as ALS. ALS pale. The formulae of leg spination are listed in Table 3.

Male palp (Figures 3–6, 15–16): RTA with a large dorsal branch, distally pointed, strongly sclerotized and moderately stepped; lateral branch forming moderately sclerotized finger-shaped appendix; ventral branch forming bulge-like moderately ventrodistally protruding stepped appendix. Tegulum broad ring-shaped, distally dividing into a filiform embolus and a tube-like apophysis (radix), proximal with a moderately serrated margin. Embolus originating (free apex) between 10 and 12 o'clock position; distal tip between 3 and 4 o’clock position. Conductor lamella-like, distally strongly elongated, laterally folded along the whole length; longer than alveolus, distally reaching over alveolus margin; terminal end forming moderately sclerotized peak. Connection of conductor and tegulum membranous, band-like. Median apophysis and tegular apophysis absent.

Epigynum and vulva (Figures 23–24, 28): rectangular epigynal plate sclerotized, often with a distinct v-shaped pattern of paler cuticula, posterior with distinct atrium region; atrium anteriorly limited by weakly sclerotized, almost straight margin of the epigynal plate; atrium

posteriorly limited by a glossy sclerite ("epigynal valve"), median deeply indented with strongly diverging margins; between anterior margin and posterior sclerite atrium covered by membranous white cuticula. Copulatory openings located at anteriolateral border of atrium. Copulatory duct first unpaired ("bursa copulatrix"), anteriorly v-shaped, then dividing into paired narrow lateral lobes directing into strongly sclerotised convoluted receptacula; fertilization ducts very short.

Distribution: Italy and Switzerland. Lombardian Prealps, from Lago Maggiore to Lago di Garda.

Ecology: Records of *H. fioni* refer to forest and open habitats such as beech or fir woods and alpine pastures at moderately high elevation, from 800 to 1600 m. The species also occur in rocky areas at an elevation of 1800-2000 m. Adults seems are found preferably from spring to autumn.

***Histopona leonardoi* sp. n.**

Figures 7–8, 12, 17–20, 25–26, 29

H. italica Brignoli, 1977: 35, f. 14–15, (m misidentified).

Type material

Holotype male: **ITALY:** Piemonte, Cuneo: Acceglio, springs of Maira River, sparse larch wood 1680 m, 1m# 4/VI/2009, Rosso M.

Paratypes: **ITALY: Val d'Aosta***:* Aosta: Ayas, Champoluc, sparse larch wood 1700 m, 1m# 31/VIII/2007, 1m# 15/VII/2009, Franco L. (CI); Gressoney-St. Jean, alpine praires 2100 m, 1m# 7/IX/2007, Negro M. (CI, Negro *et al*. 2009 sub *H. italica*); Gressoney-La-Trinité, sparse larch wood 1700 m, 1m#, 4f# 30/VI/2006, Negro M. (NMB, Negro *et al*. 2009 sub *H. italica*); Gressoney-La-Trinité, Gabiet, alpine praires 2458 m, 2f# 20/VIII/2008, Negro M. (CI, Negro *et al*. 2010 sub *H. italica*). **Piemonte**: Biella: Oropa, 1m# 24/VIII/1972, Vigna Taglianti A. (MSNVR, paratype of *H. italica*, misidentification); Vallanzengo, Val Sessera, beech wood, 3 m, 2f# 2/V/2009, 6m# 5/IX/2009, 58m#, 1f# 2/IX/2009 Franco I., Negro M.; 2f# 2/V/2009, Franco I.; Cuneo: Acceglio, springs of Maira River, sparse larch wood 1680 m, 1f# 4/VI/2009, Rosso M., (CI); Crissolo, Monviso, 1300 m, 1f# VII/1967, Osella G. (MSNVR, paratype of *H. italica*, misidentification); Entracque, Natural Park of Alpi

Marittime, beech wood close to Busset stream, 1100m, 8m#, 5 f# 29/VI-9/VIII/2007, Wolf-Schwenninger, 2f# 21/IX/2008, Isaia M., Paschetta M. (CI); Terme di Valdieri, Natural Park of Alpi Marittime, Vallone del Valasco, alpine pasture with sparse larch wood, 7 m#, 1 f# 11/VII-27/VIII/2009, Isaia M., Paschetta M.; Terme di Valdieri, Natural Park of Alpi Marittime, Pian della Casa, alpine pasture 1473 m, 1m# 11/VII/2008, Isaia M., Paschetta M. (CI, Paschetta *et al*., 2012 sub *H. italica*); Terme di Valdieri, Natural Park of Alpi Marittime, Piano del Valasco, alpine pasture with sparse larch wood, 8m#, 2f# 27/VIII-23/IX/2009, Isaia M., Paschetta M. (MSNVR); Terme di Valdieri, Natural Park of Alpi Marittime, beech wood 1368 m, 1f# 29/VI/ 2009, Isaia M., Paschetta M. (CI); Vernante, Natural Park of Alpi Marittime, Palanfrè, beech wood 1370 m, 1 f# 10/IX/2008, 2f# 22/VI/2009, Isaia M., Paschetta M., 2f# 2/VII/2010, Isaia M. (CI); Torino: Ribordone, Santuario Prascundù, 1400 m, 1f# 28/IX/2004, Giachino P.M.; cave "Tuna del Diau, 1621 Pi/TO", 1080 m, 1m# 5/X/2002, Lana E. (CI, Isaia *et al*., 2011 sub *H. italica*); Vistrorio, 1f# V-VIII/1993, Giachino P.M.; Verbania-Cusio-Ossola: Varzo, cave "Grotta di San Carlo", 1f# 4/VI/1978, Casale A. (MSNVR, Brignoli, 1979 sub *H. italica*); **Liguria**: Genova: Mezzanego, Ghiaiette, beech wood 850 m, 2 f# 31/X/2009-25/V/2010, 1m# 25/V-18/VIII/2010 Lodovici O., Pantini P., Valle M.; Mezzanego, Forest of Monte Zatta c/o ex Colonia Devoto, beech wood 1050 m, 2f# 31/X/2009-25/V/2010, Lodovici O., Pantini P., Valle M., 1f# 25/V/2010, 5m#, 7f# 25/V-18/VIII/2010 Lodovici O., Pantini P.; Propata, north slope of Monte Cremado, 1640 m, 1f# 5/VI-12/VII/1988, Cartasegna F., Pesce D. (CG); Torriglia, Passo del Colletto, 1280 m, 1f# 21/V-1/VII/1999, Pesce D. (CG); Torriglia, SE slope of Monte Duso, 1380 m, 1f# 21/V-1/VII/1999, Cartasegna F. (CG); La Spezia: Varese Ligure, Passo Cento Croci, 1000 m, 4m#, 1f# IV-VIII/1991, Cerbino R., Valle M., 2m# VI-IX/1992, Pantini P., Valle M.; Savona: Sassello, Rio del Nido, beech wood 1000 m, 4m#, 18/VII-10/X/2001; Sassello, Monte Beigua, 1000 m, 1f# 17/VII/2001; **Lombardia**: Pavia: Santa Margherita di Staffora, Hotel Colletta, beech wood 1380 m, 11m# 31/VII-19/IX/2001, 4m#, 7f# 19/IX/2001-20/III/2002, 1f# 26/IV-27/VI/2002, Pantini P.; **Emilia Romagna**: Parma: Bedonia, Passo di Montevacà, 800 m, 1m# IX/1991-V/1992, Buttarelli G., Cerbino R., Pantini P., Valle M.; Piacenza: Bobbio, Passo Penice, wood 1100 m, 6f# 20/V-20/VI/2001 (4f# NMB: 20536), 1f# 20/VI-31/VII/2001, 1m# 31/VII-19/IX/2001, 2m#, 4f# 19/IX/2001-20/III/2002, 1f# 20/III-26/IV/2002 Pantini P.; Bobbio, road to Monte Penice, wood 1400 m, 13m#, 1f# 31/VII-19/IX/2001, road margin 1400 m, 5m#, 1f# 19/IX/2001-20/III/2002, 1f# 26/IV-27/VI/2002 Pantini P.

Other material examined

SWITZERLAND: Tessin: Centovalli, Lionza, 1m#, 2f#, 6/VI/1989, 5/VII/1989, 11-25/VIII/1989, Hänggi A. (NMB: 2488 d, 20671-20672; Hänggi 1992, sub *H. italica*); Val Careccio, 2m#, 1f#, 29/IV-19/IX/1988, Pronini, P. (NMB: 20669-20670; Pronini 1989 sub *H. italica*).

Etymology: The species is dedicated to Leonardo Pantini, firstborn of PP. The species epithet is a name in apposition.

Diagnosis

Males (Figures 7–8, 17–20) can be separated by the absence of a patellar apophysis (present in *torpida* group, except *H. vignai*), the distally spoon-like elongated radix (absent in *myops*- and *strinatii* group, plate-like and distally bifid in *H. italica*, tube-like in *H. fioni* sp. n. and the distally broadly rounded conductor (strongly elongated in *H. fioni*). Females (Figures 25-26, 29) can be separated from other *Histopona* species by the glossy median indented posterior epigynal sclerite (much longer and with anterior margin only moderately indented in *torpida* group) with moderately diverging margin (parallel in *H. italica*, strongly diverging in *H. fioni* sp. n.), the unpaired "bursa copulatrix" (completely paired copulatory ducts in *myops*- and *strinatii* group) with anterior margin concave (straight or convex in *H. italica*, v-shaped in *H. fioni* sp. n.) and the narrow lateral lobes of the copulatory ducts (broad in *H. italica*). See also Table 1.

Description

Measurements and ratios of male (n=2, holotype and paratype from Entracque*):* carapace 2.25–2.86 long, 1.54–2.05 wide. Head region 0.8–1.1 wide; PER 0.45–0.62 wide. Chelicerae 1.02–1.34 long, 0.46–0.56 wide. Labium as long as wide. Gnathocoxa ratio width to length: 0.508–0.543. Sternum 1.23–1.51 long, 1.05–1.25 wide. Opisthosoma 1.98–2.46 long, 1.00–1.35 wide. Ratio bulb length (laterally from cymbium base to conductor tip) to cymbium length: 0.67–0.749. Leg measurements are given in Table 2.

Measurements of females (n=2, Paratype females from Acceglio and Entracque)*:* carapace 2.04–2.28 long, 1.38–1.63 wide. Head region 0.81–1.01 wide; PER 0.48–0.54 wide. Chelicerae 0.87–1.04 long, 0.45–0.49 wide. Labium as long as wide. Gnathocoxa ratio width to length: 0.56. Sternum 1.20–1.25 long, 1.00–1.08 wide. Opisthosoma 2.01–2.69 long, 1.35–

1.81 wide. Epigynal plate 0.70–0.72 long, 0.76–0.78 wide; atrium 0.16–0.18 long, 0.67–0.70 wide. Leg measurements are given in Table 2.

Eyes: in dorsal view both eye rows straight or slightly recurved; in frontal view AER straight or slightly procurved, PER procurved. Diameters: PME: 0.103–0.128; PLE: 0.096–0.129; AME: 0.059–0.082; ALE; 0.109–0.130. Distances: PME–PME about half diameter of PME or slightly less; PME–AME about half diameter of PME or slightly less; PME–PLE about half diameter of PME; PME–ALE about half diameter of PME or slightly less; AME–AME about half diameter of AME or slightly less; AME–ALE less than half diameter of AME. Clypeus height (measured under AME) about 3 diameters of AME or slightly more; clypeus height (measured under ALE) about twice diameter of ALE or slightly less.

Coloration: Carapace with narrow, continuous dark margin; two longitudinal symmetric darkened rows of triangular dots present on carapace; narrow darkened band median at head region present. Sternum without pattern. Opisthosoma dark grey green; cardiac mark moderately pronounced; posteriorly with indistinct pattern of chevrons. Legs without color pattern.

Additional somatic characters: distal margin of labium weakly concave. Plumose hairs present on carapace, legs and opisthosoma. Three promarginal teeth, the second one from proximal biggest; 5–7 retromarginal teeth, all equal in size. All trochanters notched. All tarsi with 6–7 dorsal trichobothria. No trichobothria on palp tarsi or cymbium. Pale colulus, sometimes moderately darkened, divided into two plates. PLS longer than all others with distal segment as long as basal segment, both moderately darkened. PMS as long as ALS. ALS moderately darkened. The formulae of leg spination are listed in Table 3.

Male palp (Figures 7-8, 12, 17-20): RTA with a big dorsal branch, distally pointed, strongly sclerotized and moderately stepped; lateral branch forming moderately sclerotized finger-shaped appendix; ventral branch forming bulge-like moderately ventrodistally protruding stepped appendix, lateral with 2–3 small stepped bands. Tegulum broadly ring-shaped, distally dividing into a filiform embolus and an elongated, distally spoon-like apophysis (radix), terminally often with a transparent portion. Embolus originating (free apex) at 11 o'clock position; distal tip between 3 and 4 o’clock position. Conductor lamella-like, distally broadly rounded and moderately elongated, laterally folded along the whole length; shorter than alveolus, distally not reaching over alveolus margin; terminal end forming moderately sclerotized peak. Connection of conductor and tegulum membranous, band-like. Median apophysis and tegular apophysis absent.

Epigynum and vulva (Figures 25-26, 29): rectangular epigynal plate sclerotized, posterior with distinct atrium; atrium anteriorly limited by strongly sclerotized, m-shaped margin of the epigynal plate with a posteriorly tapered median region; atrium posteriorly limited by a glossy sclerite ("epigynal valve"), median deeply indented with diverging margins; between anterior margin and posterior sclerite atrium covered by membranous white cuticula. Copulatory openings located at anteriolateral border of atrium. Copulatory duct first unpaired ("bursa copulatrix"), then dividing into narrow paired lateral lobes directing into strongly sclerotized convoluted receptacula; fertilization ducts very short.

Distribution: Italy and Switzerland (Tessin). All along the Western Alps and the Northern Apennine.

Ecology: Records of *H. leonardoi* mostly refer to forest habitats (beech woods at an elevation of 1000-1500 m). The species also occur at higher elevation in alpine pastures (maximum elevation reached at 2458 m in Aosta Valley). In a few cases *H. leonardoi* occurred in caves. Adults are preferably found from spring to autumn.

Discussion

According to the identification key provided by Deeleman-Reinhold (1983), *Histopona italica* forms a single-species group within the genus. The two new species described in this work increase the membership of the *italica* group, which is defined for females by the presence of a glossy, median deeply indented posterior epigynal sclerite and by the unpaired copulatory ducts, and for males by the absence of a patellar apophysis and by the shape of the embolus, originating basal to the protruding radix.

During the examination of the material here presented, large differences in the size of the male palp could be observed, even between specimens from the same locality (e.g. 2m# from Liguria, La Spezia: Varese Ligure, Passo Cento Croci). Within the examined specimens of *H. leonardoi* two males were distinctly larger and the palps were more sclerotized (Figures 17-18). Due to the fact that body size is a weak character and the lack of morphological differences in any body structure, these specimens are regarded as exceptionally large members of the same species. Similar cases of size variation can be observed in other

members of Agelenidae, e.g. in *Malthonica picta* Simon (Bolzern, unpublished) or *Tegenaria femoralis* Simon (Kraus, 1955).

Records of species belonging to the *Histopona italica* group are known from large parts of Italy (from Calabria to Trentino, along the entire Appenine range, through the Western Alps up to the Lombardian Prealps) (Figure 30). In some cases, specimens of *H. italica* and *H. leonardoi* were collected together, indicating sympatric locations. Accordingly, the known distribution of *H. italica* overlaps that of *H. leonardoi* in the district of Maritime Alps and Northern Apennines, the first extending southwards along the Apennines and the latter northwards, along the Alps. It is likely that *H. leonardoi* also occurs in the French part of Maritime Alps

Records of *H. fioni* are only known from the Lombardian Prealps (Lombardia and southern Trentino in Italy and Tessin in Switzerland). Apparently, no overlap occurs between *H. fioni* and *H. leonardoi*, being separated by Lake Maggiore, at the border with Piemonte and Lombardia (Tessin Valley). Similarly, the same separation occurs in *Coelotes pickardi tirolensis* Kulczyn'ski and *C.p. pickardi* O. P.-Cambridge (see Isaia & Pantini 2009) and in *Troglohyphantes lucifuga* Simon and *T. sciaky* Pesarini (see Isaia & Pantini 2010).

Concerning the illustrations and citations referring to *H. italica* provided in previous papers, several misidentifications occurred.

During the examination of the type material, we could identify one male of *H. leonardoi* from Oropa (Piemonte: Province of Biella), one male of *H. fioni* from Entratico (Lombardia: Province of Bergamo) and one female of *H. leonardoi* from Crissolo (Piemonte: Province of Cuneo). Despite the lack of information about the sampling localities of the illustrated specimens, it is likely that the illustrations depicting the male (Brignoli, 1977: 37, Figures 14-15) refer to *H. leonardoi* (presumably the paratype male from Oropa – it is worth noting that among the type material, this male was the only specimen with the left palp detached). Similarly, we examined the material from Varzo - Cave of San Carlo (Piemonte: Province of Verbania) cited by Brignoli some years later (1979) and re-assigned it to *H. leonardoi.*

Deeleman-Reinhold (1983) illustrated the vulva of one paratype female of *H. italica* without giving any information about the sampling locality. The only detached epigyne found in the type material belongs to a specimen collected by G. Osella in Pesio Valley (Laghetti del Marguareis, Briga Alta, Province of Cuneo), which upon examination was clearly identified as *H. italica.*

The male illustrated by Hänggi (1990: 162, Figure 21a) from Tessin (Monte Generoso, CH) is in fact *H. fioni*; on the other hand, the drawing of the female (Hänggi (1990:162, Figure 21b)

illustrates a specimen from an unspecified locality in "Northern Italy" ("*Eine Abbildung der Epigyne eines Weibchen aus Norditalien wurde mir von Herrn Dr. R. Maurer zur Verfügung gestellt und wird hier ergängzend angefügt*" ["In addition, an illustration of the epigyne of a female specimen from Northern Italy has been provided by Dr. R. Maurer"] Hänggi 1990:163), and may refer either to *H. italica* or *H. leonardoi*, as the illustration is insufficient to distinguish between the two species. These same illustrations were reproduced in Trotta (2005).

Groppali *et al*. (1995) reported specimens from the Apennine of Pavia that were not examined in the current study. The identification of this material on a geographic basis is not possible, given the overlapping distributions of *H. italica* and *H. leonardoi* in this area.

The material cited by Pantini (2000) from the Mountains of Sebino (Province of Bergamo) was re-examined and identified as *H. fioni.* Pesarini (2003) refers to specimens collected in Tuscany that are likely to be identified as *H. italica* (not examined). Isaia *et al*. (2007) reported material from Lombardia that was re-examined and assigned to *H. fioni.* Concerning the material from Piemonte cited in the same publication, specimens from Garessio (Province of Cuneo) were found to belong to *H. italica* and represent, together with the paratype from Val Pesio (cited in Brignoli, 1977 and illustrated by Deeleman-Reinhold, 1983), the most western records within the distribution range of this species.

Lambiase *et al*. (2007) reported specimens from Maritime Alps (Piemonte: Province of Cuneo) which is within the overlapping range of *H. italica* and *H. leonardoi*. This material was not examined and identification therefore remains doubtful.

De Angelis & Fantoni (2008) report *H. italica* from Aosta Valley. Despite the fact that this material was not examined, it is likely that, based on geography, this specimen belongs to *H. leonardoi*. Material from Aosta Valley cited in Negro *et al*. (2009, 2010) was re-examined and re-assigned to *H. leonardoi.* Specimens reported in Isaia *et al*. (2011) for caves of Western Italian Alps refer to *H. leonardoi*, as well as the material cited by Paschetta *et al* (2012) from pasturelands in the district of Maritime Alps.

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720 **Figure legends**

721

722 Figures 1–8. Left male palp in ventral, dorsal, dorsolateral and retrolateral view. 1, 2.
723 *Histopona italica* (paratype, Marche); 3, 4, 5, 6. *H. fioni* sp. n.; 7, 8. *H. leonardoi* C:
724 conductor; E: embolus; RTA: retrolateral tibial apophyses; RTAd: dorsal branch of RTA;
725 RTAl: lateral branch of RTA; RTAv: ventral branch of RTA.

726

727 Figures 9–10. *Histopona fioni* sp. n.: eyes in frontal and dorsal view. Scale = 1.0 mm.

728

729 Figures 11–12. Chelicerae and tibia with RTA of left male palp in dorsoretrolateral view. 11.
730 *Histopona fioni* sp. n. 12. *H. leonardoi* RTA: retrolateral tibial apophyses; RTAd: dorsal
731 branch of RTA; RTAl: lateral branch of RTA; RTAv: ventral branch of RTA. Scale = 1.0 mm
732 (11) and 0.5 mm (12).

733

734 Figures 13–20. Left male palp in ventral, and retrolateral view. 13, 14. *Histopona italica*; 15,
735 16. *H. fioni* sp. n.; 17- 20. *H. leonardoi* n. sp, large sclerotized (17-18) and small "normal"
736 palps (19-20). Scale = 1.0 mm. The arrow indicates the distinctly stepped connection between
737 conductor and tegulum in *H. italica*.

738

739

740 Figures 21–26. Epigyne and vulva in ventral view. Vulva cleared with clove oil. 21, 22.
741 *Histopona italica* (holotype); 23, 24. *H. fioni* sp. n.; 25, 26. *H. leonardoi* Scale = 1.0 mm.

742

743 Figures 27–29. Schematic drawing of vulva in ventral view. 27. *Histopona italica*; 28. *H.*
744 *fioni* sp. n.; 29. *H. leonardoi* sp. n.. CO: copulatory opening; FD: fertilization duct; latCD:
745 lateral lobe of the copulatory duct; RC: receptaculum; Arrows indicate the posterior margin of
746 the copulatory duct. Scale = 1.0 mm.

747

748 Figure 30. Distribution of *Histopona italica, H. fioni* and *H. leonardoi*.

749

Tables

Table 1. Diagnostic characters for *Histopona italica*, *H. fioni* sp. n. and *H. leonardoi* sp. n.

Character		***H. italica***	***H. fioni***	***H. leonardoi***
Male palp	Ventral branch of retrolateral tibial apophysis (RTAv)	Strong protruding, distally rounded	Moderately protruding, distally stepped	Moderately protruding, distally with 2–3 small stepped bands
	Radix	One pointed and one rounded, plate-like end	Tube-like	Plate or spoon-like
	Conductor	Distally broad rounded and moderately elongated	Distally strongly elongated	Distally broad rounded and moderately elongated
	Connection conductor-tegulum	Distinctly stepped (arrow in Figure 14)	Continuous	Continuous
Epigynum and vulva	Anterior limitation of atrium	M-shaped margin of the epigynal plate with a posteriad tapered median region	Almost straight margin of the epigynal plate	M-shaped margin of the epigynal plate with a posteriad tapered median region
	Median margins of glossy posterior sclerite	Almost parallel	Strongly divergent	Divergent
	Shape of anterior part of copulatory duct (arrows in Figures 27–29)	Straight or moderately convex	Concave, v-shaped	Concave
	Lateral lobes of copulatory ducts	Very broad, distinct	Narrow, band-like	Narrow, band-like

760 Table 2. Leg measurements (mm) of *Histopona italica*, *H. fioni* sp. n. and *H. leonardoi* sp. n.

H. italica Brignoli, 1977						
Paratype male from Apecchio						
	fe	**pa**	**ti**	**mt**	**ta**	**total**
Palp	1.15	0.49	0.40	-	1.50	3.54
I	2.28	0.93	2.01	2.14	1.61	8.97
II	2.06	0.89	1.55	1.83	1.27	7.60
III	2.04	0.84	1.58	2.04	1.14	7.64
IV	2.68	1.01	2.26	2.94	1.43	10.32
Paratype female from Apecchio						
Palp	0.95	0.46	0.65	-	1.11	3.17
I	2.03	0.88	1.66	1.72	1.41	7.70
II	1.86	0.85	1.36	1.51	1.08	6.66
III	1.85	0.75	1.34	1.81	1.08	6.83
IV	2.30	0.88	2.01	2.60	1.40	9.19
H. fioni sp. n.						
Holotype male and paratype male from Pagnona (n=2)						
Palp	1.23–1.40	0.49–0.58	0.43–0.48	-	1.54–1.79	3.69–4.25
I	2.61–2.79	1.00–1.03	2.36–2.52	2.42–2.61	1.82–1.97	10.21–10.92
II	2.45–2.72	0.97–1.06	1.97–2.12	2.27–2.42	1.64–1.82	9.3–10.14
III	2.42	0.94	1.85	2.45	1.52	9.18
IV	3.06–3.33	0.97–1.00	2.67–2.85	3.42–3.64	1.85–1.97	11.97–12.79
Paratype females from Pagnona and Rovereto (n=2)						
Palp	1.18–1.23	0.49–0.60	0.51–0.85	-	1.05–1.26	3.23–3.94
I	2.64–2.75	1.09–1.15	2.30–2.50	2.24–2.50	1.67–1.85	9.94–10.75
II	2.45–2.60	1.00–1.06	1.94–2.10	2.15–2.25	1.58–1.60	9.12–9.61
III	2.36–2.42	0.94–0.96	1.82–1.96	2.31–2.36	1.30–1.31	8.73–9.01
IV	2.97–3.08	1.04–1.06	2.64–2.77	3.21–3.35	1.67–1.73	11.53–11.99
H. leonardoi sp. n.						
Holotype male and paratype male from Entracque (n=2)						
Palp	0.89–1.19	0.38–0.47	0.33–0.38	-	1.01–1.63	2.61–3.67
I	2.07–2.33	0.76–0.91	1.81–2.12	1.92–2.15	1.34–1.63	7.90–9.14
II	1.95–2.25	0.78–0.86	1.51–1.77	1.78–1.99	1.26–1.52	7.28–8.39
III	1.86–2.06	0.69–0.93	1.40–1.69	1.91–2.25	1.11–1.24	6.97–8.17
IV	2.42–2.73	0.78–0.92	2.09–2.42	2.71–3.15	1.44–1.58	9.44–10.8
Paratype females from Acceglio and Entracque (n=2)						
Palp	0.78–0.84	0.32–0.37	0.50–0.52	-	0.88–0.91	2.48–2.64
I	1.70–1.88	0.70–0.83	1.38–1.61	1.40–1.64	0.92–1.28	6.10–7.24

II	1.52–1.78	0.68–0.73	1.10–1.23	1.32–1.48	0.94–1.06	5.56–6.28
III	1.50–1.72	0.66–0.73	1.08–1.29	1.38–1.68	0.76–0.90	5.38–6.32
IV	1.94–2.25	0.74–0.79	1.62–1.92	2.04–2.45	1.02–1.19	7.36–8.60

Table 3. Spination of legs of *Histopona italica*, *H. fioni* sp. n., *H. leonardoi* sp. n. The formula gives the number of spines as follows: dorsal - prolateral - retrolateral – ventral; *p* indicates that the spine is paired (1*p* = 2 spines); *s* indicates the presence of a short and strong spine. A superscript "-" or "+" indicates that a lower or a higher number of spines have been occasionally observed at this position.

Leg	Species	fe	pa	ti	mt	ta
Palp	*H. italica*	3–0–0–0	2–0–0	1^{+}–2–0–0	-	-
	H. fioni	2^{+}–0–0–0	2–0–0	1^{+}–2^{-}–0–0 2–1+1p–0–0 2–2p–0–0	-	-
	H. leonardoi	2–0–0–0	2–0–0	1^{+}–2^{-}–0–0	-	-
I	*H. italica*	3^{+}–1^{+}–1–0	2–0–0	2–1–0–3p 2–2–0–1+2p	0–0–0–1+2p+1 0–1–0–3p+1	0
	H. fioni	1^{++}–1^{+}–0^{+}–0	2–0–0	2^{--}–1^{+}–0–3p 2–2–0–2p+1	0–0^{+}–0–3p+1	0
	H. leonardoi	1^{++}–1–0^{+}–0	2–0–0	2–1–0–1p 2–2–0–1+1p+1 2–2–0–1+2p 2–2–0–$1p^{+}$+1	0–0–0–3p+1	0
II	*H. italica*	2^{++}–1–1–0	2–0–0	1^{+}–2^{-}–0–1+$1p^{+}$	0–2–0^{++}–1+2p+1 0–4–1–1+2p+1	0
	H. fioni	3–1^{++}–1^{+}–0	2–0–0	2–2–0^{+}–3p	0–2–0^{+}–3p+1	0
	H. leonardoi	2^{+}–1–1–0	2–0–0	2–2–0–1+1p+1 2–2–0–1p+1 2–2–0–2	0–2–0^{+}–3p+1	0
III	*H. italica*	1^{++}–1^{+}–1–0	2–0–0	1^{+}–2–2^{-}–2+1p	1^{+}–3–3–3p+1	0–0–1–1
	H. fioni	3–2–2–0	2–0–0	2–2–2–1+2p 2–2–2–1p+1+1p 2–2–2–3p	1–3–3–1p+1+2p+1 1–3–3–3p+1	0–0–1–1
	H. leonardoi	2^{+}–1^{+}–1–0	2–0–0	2–2–2–2+1p	1–3–3–3p+1	0–0–0^{+}–1
IV	*H. italica*	2^{+}–1–1–0	2–0–0	2–2–2–1p+1+1p 2–2–2–2+1p	1^{+}–3–3–4p+1	0–2–2–2
	H. fioni	3–1^{+}–1–0	2–0–0	2–2–2–1+2p 2–2–2–1p+1+2p 2–2–2–3p	2–3–3–1p+1+2p+1	0–1^{+}–2–0^{++}
	H. leonardoi	1^{++}–1–1–0	2–0–0	2–2–1^{+}–2+1p	2–3–3–3p+1	0–2–2–2