

# The Western Palearctic *Neocrepidodera* (Coleoptera: Chrysomelidae) of the *N. impressa* and *N. ferruginea* Species Groups

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**ABSTRACT** The Western Palearctic taxa of the *Neocrepidodera impressa* (F.) and *Neocrepidodera ferruginea* (Scopoli) species groups are reviewed. Twelve species are recognized, two of them newly described, *N. carolinae* sp. nov. from High Atlas, Morocco, and *N. precaria* sp. nov. from southern Spain and northern Morocco. Two other species are raised from the subspecific status, *N. hispanica* (J. Daniel) stat. nov. and *N. peregrina* (Harold) stat. rev., taking into account their constant marked external and genital differences with *N. crassicornis* (Falderman) and *N. impressa* (F.), respectively. A key for the Western Palearctic region is provided, including external, male and female genital features for each taxon. Special effort was devoted to the identification of females, finding that vaginal palpi show useful diagnostic characters. Figures of pronotum, aedeagus, vaginal palpi, and spermatheca are presented for all species.

**RESUMEN** Se revisan los taxones presentes en la región paleártica occidental de los grupos de especies de *Neocrepidodera impressa* (F.) y *N. ferruginea* (Scopoli). Se identifican 12 especies, dos de ellas descritas por primera vez, *N. carolinae* sp. nov. del Gran Atlas, Marruecos y *N. precaria* sp. nov. del sur de España y norte de Marruecos. Otras dos especies han sido elevadas desde el estatus subespecífico, *N. hispanica* (J. Daniel) stat. nov. y *N. peregrina* (Harold) stat. rev., teniendo en cuenta sus constantes marcadas diferencias con *N. crassicornis* (Falderman) y *N. impressa* (F.), respectivamente. Se ofrece una clave para la región paleártica occidental, incluyendo caracteres externos, genitales masculinos y femeninos para cada especie. Se ha puesto especial interés en la identificación de las hembras, hallando que los palpos vaginales muestran caracteres diagnósticos útiles. Se presentan figuras del pronoto, edeago, palpos vaginales y espermateca para todas las especies.

**KEY WORDS** Chrysomelidae, *Neocrepidodera impressa* group, *Neocrepidodera ferruginea* group, new species, female genitalia

THE GENUS *Neocrepidodera* Heikertinger (Coleoptera: Chrysomelidae: Galerucinae: Alticini) is comprised of >100 species distributed in the Holarctic, Oriental, and Afrotropical regions, about a half of them occurring in the Palearctic region (Konstantinov and Vandenberg 1996). The Palearctic taxa were revised by Daniel (1904) and Heikertinger (1948), and more recently Biondi (1989, 1993) analyzed the phylogenetic relations among the Western Palearctic species. This author also provided a historical review of the nomenclatural change from *Crepidodera* Chevrolat to *Asiolestia* Jacobson (Biondi 1993). Finally, Konstantinov and Vandenberg (1996) synonymized *Asiolestia* with *Neocrepidodera*. Biology of *Neocrepidodera* is still poorly known, but Asteraceae and Poaceae seem to be the most selected host plants (Doguet

1994). Due to its agricultural interest, life cycle, and larval stages of *N. ferruginea* (Scopoli) are better known (Blunck 1932). This species develops on Poaceae, sometimes producing damage on wheat, oat, and barley cultures (Doguet 1994).

The taxa considered in this article are the light-colored, nonmontane species included in the group I [1. Gruppe] by Daniel (1904) and the species groups of *N. impressa* (F.) and *N. ferruginea* (Scopoli) by Biondi (1989). We follow the terminology of the latter author. Taking into account only the Western Palearctic taxa, eight species and three subspecies are currently recognized (Gruev and Döberl 1997, Warchalowski 2003). All of them are morphologically similar, and diagnostic characters mostly used within this group were kind of elytral punctation, shape of pronotum and its anterolateral callosity, size of pronotal punctures, and morphology of male genitalia (Mohr 1966, Doguet 1994, Warchalowski 2003). Regarding female genitalia, Doguet (1994) included figures of the spermathecae, but usefulness of these structures is very low due to their uniformity and even their in-

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traspecific variation. Although Doguet (1994) used the vaginal palpi in some other species within *Neocrepidodera*, this female structure was never explored for the light-colored taxa.

The extreme similarity between taxa and the difficulty in identifying females, together with the sympatric distributions of many species, make the taxonomy of the *N. impressa* and *N. ferruginea* species groups difficult. The purpose of this article is to 1) study the vaginal palpi of Western Palearctic taxa, making available accurate diagnostic characters for females; 2) reassess the status of the taxa currently considered subspecific; 3) describe two new species based on specimens from southern Spain and Morocco; and 4) to provide a key to the *N. impressa* and *N. ferruginea* species groups from the Western Palearctic region.

### Materials and Methods

This study is mainly based on the collections of Museo Nacional de Ciencias Naturales, Madrid, Spain (MNCN), and National Museum of Natural History, Washington, DC (USNM). Also, personal collections of A. Baselga, Santiago de Compostela, Spain (BASC) and G. Bastazo and J. M. Vela, Málaga, Spain (BAVC), were reviewed as well as some specimens were borrowed from M. Bergeal, Versailles, France (BERC), M. Biondi, L'Aquila, Italy (BIOC), S. Doguet (DOGC), and F. Fritzl, Jena, Germany (FRIC). S. Doguet also has provided several individuals belonging to the Musée d'Histoire Naturelle de Lyon (MHNL). Finally, some specimens now deposited in BASC were kindly provided by M. Döberl (Abensberg, Germany).

A detailed description is provided for the new species, but only diagnoses are provided for previously known taxa. Male and female genitalia were dissected, cleared with Amman Lactophenol, and thereafter mounted along with specimens using dimethyl hydantoin formaldehyde resin (DMHF). Drawings were traced using CorelDraw 9 software, from images captured with a Nikon Coolpix 4500 digital camera attached to a Zeiss 475057 stereomicroscope. Aedeagi are illustrated in ventral view, and figures of pronota include schematic representation of both discal and antebasal punctation.

#### *Neocrepidodera crassicornis* (Faldermann)

(Figs. 1, 13, 25)

**Material Examined.** BOSNIA AND HERZEGOVINA: Sarajevo [Sar.], Ilidza [Ilidz.], one specimen (Apfelbeck, USNM); GEORGIA: Abkhazia, N Gudauta, P'skhu, 1,700 m, 16 June 1984, six specimens (A. Konstantinov, USNM); Abkhazia, N Gudauta, P'skhu, Bzyb' River, 17 June 1984, three specimens (A. Konstantinov, USNM); Abkhazia, P'skhu, 19 June 1984, two specimens (A. Konstantinov, USNM); ITALY: Torino, Torrente [T.] Sangone, 26 July 1907, three specimens (Della Beffa, MNCN); RUMANIA: Comana, Vlasca, four specimens (A.L. Montandon, USNM); RUSSIA: Daghestan, one specimen (Shapiro,

USNM); Daghestan, Madzhalis, 18 June 1964, 1,700 m, one specimen (USNM); Krasnodarskiy Kray, Krasnaya Polyana, 27 June 1982, one specimen (A. Konstantinov, USNM); Krasnodarskiy Kray, Novomikhaylovskiy, 24 June 1982, one specimen (A. Konstantinov, USNM); Krasnodarskiy Kray, Tuapse, 22 June 1982, three specimens (A. Konstantinov, USNM); North Ossetia, 11 June 1978, one specimen (USNM); North Ossetia, Koban', 14 June 1978, two specimens (Agnaveva, USNM).

**Diagnosis.** Length 3.0–4.0 mm. *Pronotum*: slightly constricted basally, narrowly margined. Anterolateral callosity rounded, poorly developed and almost symmetrical. Surface covered with minute punctures, both on disc and basal region, with only a few slightly greater punctures in the antebasal transverse groove (Fig. 1). *Elytra*: punctation completely seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly disordered (especially in females). Punctures small and shallow. Interstriae almost flat and broader than striae. Base of sixth elytral stria normally impressed, as deep as the other striae. *Aedeagus*: larger than in *N. ferruginea* (Scopoli), strongly expanded in the apical third, apex wide rounded (Fig. 13). *Vaginal palpi*: long and slender, curved and almost parallel sided (Fig. 25a), basal membranous region long. *Spermatheca*: as in Fig. 25b.

**Remarks.** The specimen from Bosnia shows a stronger pronotal punctation similar to *N. ferruginea*, both on disc and antebasal area. However, the aedeagus allows to assign this specimen undoubtedly to this species.

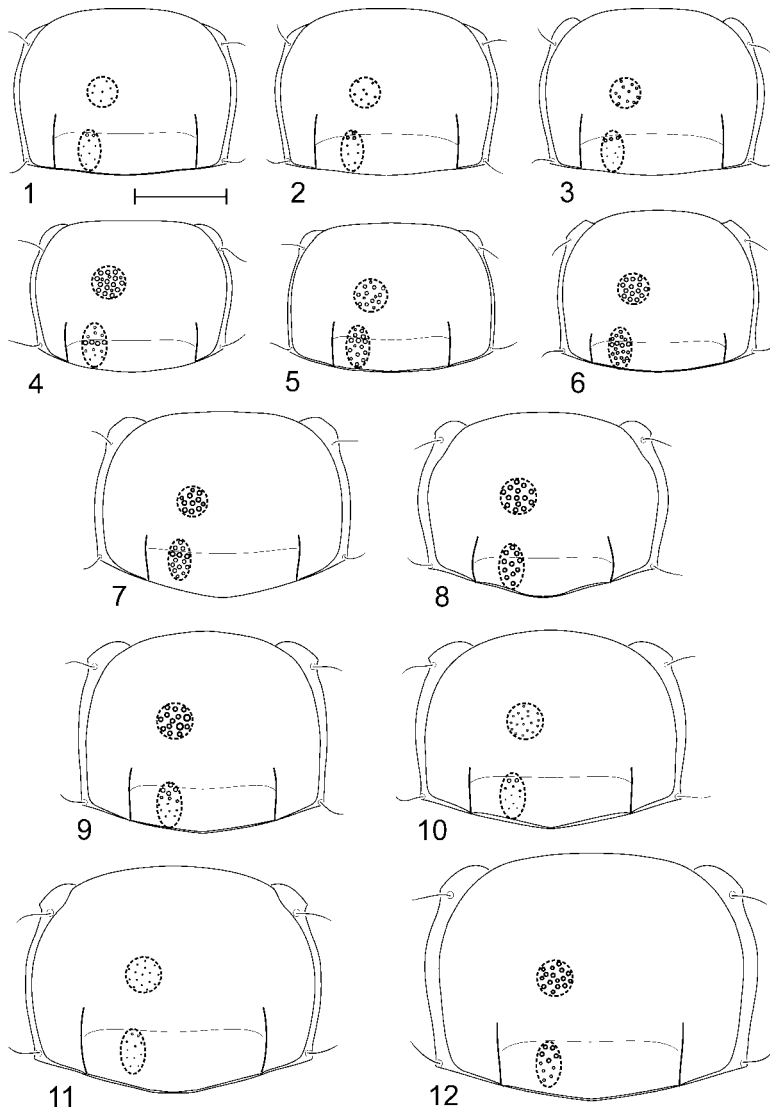
**Distribution.** Southern Europe from France to Ukraine and southern Russia, Turkey, Caucasus, Kazakhstan (Mid).

#### *Neocrepidodera hispanica* (J. Daniel), stat. nov

(Figs. 2, 14, 26)

**Material Examined.** FRANCE: Camargue, one specimen (L. Puel, BERC); PORTUGAL: Trás-os-Montes, Mogadouro, Castelo Branco, 20 June 2001, two specimens (A. Baselga, BASC); SPAIN: Avila, 23 June ?, 20 specimens (MNCN); Madrid, 11 specimens (Pérez Arcas, MNCN); Madrid, two specimens (Canal, MNCN); Madrid, one specimen (Arias, MNCN); Madrid, El Escorial, 10 specimens (MNCN); Madrid, Navacerrada, one specimen (Uhagón, MNCN); Segovia, Marazoleja, two specimens (Callejo, MNCN); Segovia, Villacastín, five specimens (MNCN); Teruel, Albarracín, three specimens (Zapater, MNCN).

**Diagnosis.** Length 3.0–4.1 mm. *Pronotum*: slightly constricted basally, narrowly margined. Anterolateral callosity rounded, poorly developed and almost symmetrical. Surface covered with fine punctures, both on disc and basal region, with only a few slightly greater punctures in the antebasal transverse groove (Fig. 2). In some specimens, discal punctation slightly stronger, moderate in size. *Elytra*: punctation completely seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly disordered (especially in females). Punctures large



Figs. 1–12. Pronota of *Neocrepidodera* spp. Circle and oval represent schematic samples of discal and antebasal punctation, respectively. (1) *N. crassicornis*. (2) *N. hispanica*. (3) *N. carolinae* n. sp., paratype (4) *N. motschulskii*, paratype. (5) *N. ferruginea*. (6) *N. interpunctata*. (7) *N. bolognai*, paratype. (8) *N. brevicollis*. (9) *N. transversa*. (10) *N. impressa*. (11) *N. peregrina*. (12) *N. precaria* n. sp., paratype. Scale bar, 0.5 mm.

and deep. Interstriae slightly convex and as broad as striae or narrower. Base of sixth elytral stria normally impressed, as deep as the other striae. *Aedeagus*: expanded in the apical fourth, apex wide rounded and produced into an obtuse denticle (Fig. 14). *Vaginal palpi*: short, strongly curved and almost parallel sided, basal membranous region very short (Fig. 26a). *Spermatheca*: as in Fig. 26b.

**Remarks.** This taxon was described by Daniel (1904) as a subspecies of *N. crassicornis*. We consider that constant marked differences in both male and female genitalia between the two taxa make the specific status more appropriate for *N. hispanica*.

**Distribution.** Central and northern Iberian peninsula, south of France.

*Neocrepidodera carolinae* Baselga & Novoa, sp. nov  
(Figs. 3, 15, 27)

**Type Material.** HOLOTYPE MALE: MOROCCO: "Glaui" [handwritten label by M. Escalera]. This locality refers to Ouarzazate, Telouet (=Dar Kaid el Glaoui); PARATYPES: 24 specimens, same data as holotype. Holotype and paratypes are deposited in the Museo Nacional de Ciencias Naturales, Madrid, Spain (Type Catalog No. 9570).

**Etymology.** We name this new species for Carolina Martín, curator of the MNCN, in gratitude for all her support and kindness.

**Diagnosis.** Length 3.3–4.2 mm. *Pronotum*: slightly constricted basally, narrowly margined. Anterolateral

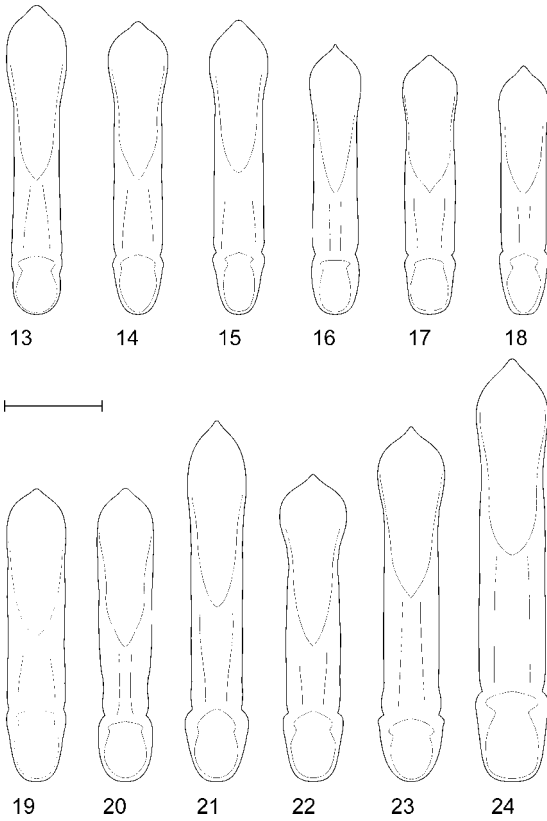


Fig. 13–24. Median lobe of aedeagi of *Neocrepidodera* spp., ventral view. (13) *N. crassicornis*. (14) *N. hispanica*. (15) *N. carolinae* n. sp., paratype (16) *N. motschulskii*, paratype. (17) *N. ferruginea*. (18) *N. interpunctata*. (19) *N. bolognai*, paratype. (20) *N. brevicollis*. (21) *N. transversa*. (22) *N. impressa*. (23) *N. peregrina*. (24) *N. precaria* n. sp., paratype. Scale bar, 0.5 mm.

callosity well developed, strongly produced anteriorly and thus asymmetrical. Surface covered with moderately fine punctures on disc, minute on basal region, with only a few slightly greater punctures in the antebasal transverse groove (Fig. 3). *Elytra*: punctuation completely seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly disordered (especially in females). Punctures large and deep. Interstriae slightly convex and as broad as striae or narrower. Base of sixth elytral stria strongly impressed, deeper than the other striae. *Aedeagus*: expanded in the apical fourth, apex subtriangular, forming no denticle (Fig. 15). *Vaginal palpi*: relatively long and slightly curved, basal membranous region short (Fig. 27a). *Spermatheca*: as in Fig. 27b.

**Description.** Length 3.3–4.2 mm. Body convex, about two times longer than wide. Color yellowish brown. *Head*: slightly convex. Labrum bearing three pairs of setae in anterior margin. Clypeus bearing four pairs of long setae in anterior margin and many other shorter ones. Frontal ridge between antennal calli wide. Antennal calli oval, hardly delineated from vertex. Vertex smooth and shiny, with a strong deep

seta-bearing puncture near each eye. Third antennomere  $\approx 1.5$  times longer than second, slightly longer than fourth and shorter than fifth. *Pronotum*: 1.3 times broader than long, widest at middle, slightly constricted basally, narrowly margined, provided with an antebasal transverse furrow delimited laterally by two longitudinal impressions. Anterolateral callosity well developed, strongly produced anteriorly and thus asymmetrical. Surface shiny, covered with moderately fine punctures on disc, minute on basal region, with only a few slightly greater punctures in the antebasal transverse groove (Fig. 3). *Elytra*: moderately convex,  $\approx 1.5$  times longer than broad, widest before middle. Humeral callus well developed, macropterous. Lateral margins explanate, apex rounded. Surface shiny. Punctuation arranged in 10 distinct striae, scutellar stria short. Punctures, large and deep, regularly seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly disordered (especially in females). Interstriae slightly convex and as broad as striae or narrower, covered with extremely minute micropunctures. Base of sixth elytral stria strongly impressed, deeper than the other striae, delimiting anteriorly the humeral callus. *Aedeagus*: expanded in the apical fourth, apex subtriangular, forming no denticle (Fig. 15). *Vaginal palpi*: relatively long and slightly curved, basal membranous region short (Fig. 27a). *Spermatheca*: as in Fig. 27b.

**Remarks.** This new species is close to *N. hispanica* and *N. crassicornis* based on the shape and punctuation of pronotum, but especially by their similar male and female genitalia. However, external characters such as the pronotal anterolateral callosity and the base of sixth elytral stria, as well as the structure of aedeagus and vaginal palpi show constant marked differences. Taking into account the high morphological homogeneity among light colored species of *Neocrepidodera*, we thus consider these differences between the three taxa to justify the description of this new species, as well as the specific status for *N. hispanica*.

The citations of *N. crassicornis* in North Africa (Kocher 1958), considered questionable or erroneous by Gruev and Döberl (1997), could be attributed to this new taxon, because of its similarity and because one of this records corresponds probably with the same series here designated type material, as specimens share locality and collector: "Glaoui (Escalera)" (Kocher 1958: 131).

**Distribution.** Morocco. This new species is known only from the type locality, Telouet,  $\approx 1,800$  m of altitude in the High Atlas mountains. However, if the citations of *N. crassicornis* were confirmed to be *N. carolinae*, the species could be distributed in both High Atlas and Middle Atlas.

*Neocrepidodera motschulskii* (Konstantinov)  
(Figs. 4, 16, 28)

**Material Examined.** BELARUS: Gomel', Doroganovo, 15 July 1985, one specimen (A. Konstantinov, USNM); Gomel', Turov, 23 June 1980, one specimen (A. Konstantinov, USNM); Minsk env., 21 July 1979, 13

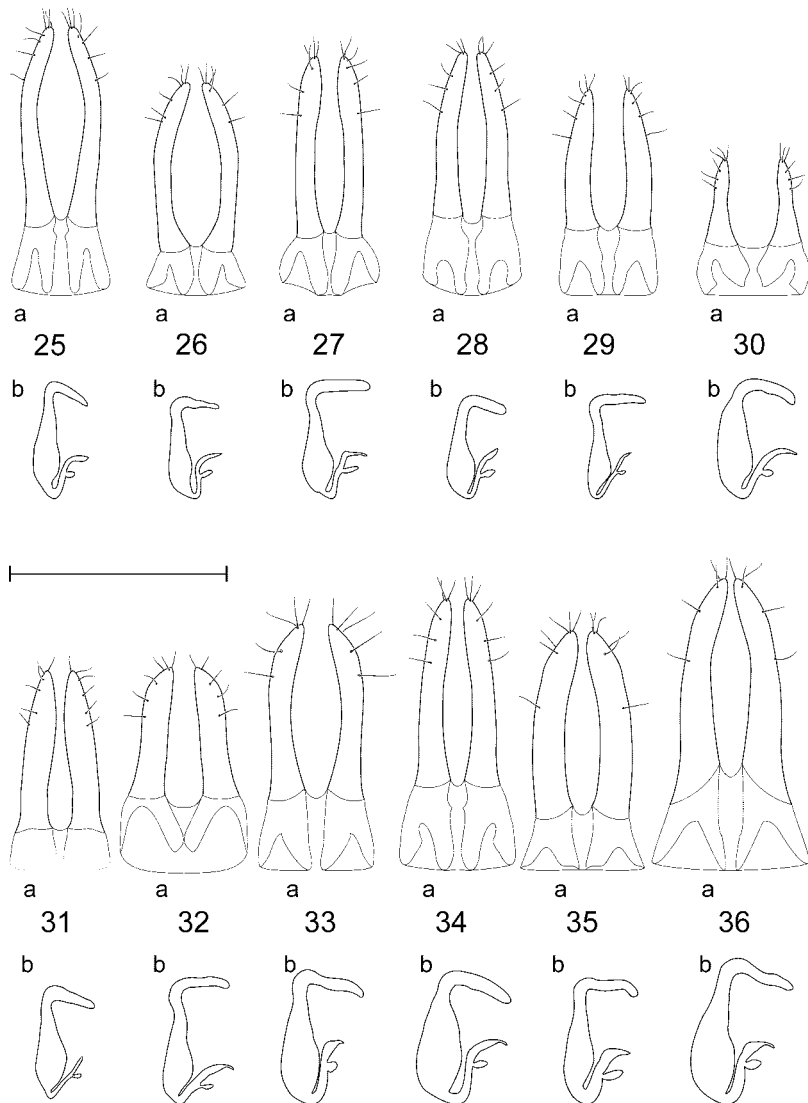


Fig. 25–36. Female genitalia of *Neocrepidodera* spp. (a) Vaginal palpi. (b) Spermatheca. (25) *N. crassicornis*. (26) *N. hispanica*. (27) *N. carolinae* n. sp., paratype (28) *N. motschulskii*. (29) *N. ferruginea*. (30) *N. interpunctata*. (31) *N. bolognai*, paratype. (32) *N. brevicollis*. (33) *N. transversa*. (34) *N. impressa*. (35) *N. peregrina*. (36) *N. precaria* n. sp., paratype. Scale bar, 0.5 mm.

specimens (A. Konstantinov, USNM); Vitebsk, Naroch', Berezinski res., April 1983, one specimen (S. Saluk, USNM); FRANCE: Lozère, Mont Lozère, L'Hôpital, 22 July 1977, one specimen (J. C. Lecoq, DOGC); Pyrénées-Orientals, Massif du Madrès, ravin du Canrec, 12 July 1983, two specimens (S. Doguet, DOGC); GEORGIA: Bakuriani, 13 July 1981, one specimen (PARATYPE, A. Konstantinov, USNM); GERMANY: Baden Württemberg, Michelwinnaden, 28 July 1991, one specimen (M. Bergeal, BERG); RUSSIA: Bashkiria, Maginsk, 19 June 1990, two specimens (P. Schnitter, FRIC); Bryansk, Unecha, Unecha river, 20 June 1981, three specimens (A. Konstantinov, USNM); Kazan', one specimen (Cski, USNM); Smolensk, Temkino, Skotinino, 23 July 1980, nine speci-

mens (A. Konstantinov, USNM); 28 June 1983, two specimens (A. Konstantinov, USNM); SWEDEN: Upland, Almunge, Harparbol, 21 July 1948, two specimens (O. Lundblad, MNCN).

**Diagnosis.** Length 3.0–4.1 mm. *Pronotum*: constricted basally, narrowly margined. Anterolateral callosity rounded, well developed and slightly asymmetrical. Surface covered with coarse punctures on disc and minute ones on basal region, with greater punctures in the antebasal transverse groove (Fig. 4). In some specimens these strong punctures extend almost to the base, but there is always a basal strip covered with minute punctures. *Elytra*: punctuation completely seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly

disordered (especially in females). Punctures large and deep. Interstriae slightly convex and slightly wider than striae. Base of sixth elytral stria strongly impressed, deeper than the other striae. *Aedeagus*: produced apically into a very acute point (Fig. 16). *Vaginal palpi*: long, slightly curved and slightly tapering to the apex, basal membranous region long (Fig. 28a). *Spermatheca*: as in Fig. 28b.

**Distribution.** North and Central Europe, reaching France to the south, Turkey, Caucasus, Tajikistan.

*Neocrepidodera ferruginea* (Scopoli)

(Figs. 5, 17, 29)

**Material Examined.** AUSTRIA: Karnten, Maltal, five specimens (USNM); BELARUS: Bialoweza Forest, 26 April 1980, one specimen (O. R. Alexandrovich, USNM); Minsk, park Chelyukitsev, 18 July 1979, seven specimens (A. Konstantinov, USNM); Naroch', 16 August 1982, one specimen; 20 August 1982, one specimen (I. Lopatin; USNM); Vitebsk, Braslov, Chernyshki, 9 July 1981, five specimens (A. Konstantinov, USNM); Vitebsk, Braslov, Opsa, 17 July 1981, seven specimens (A. Konstantinov, USNM); BOSNIA AND HERZEGOVINA: Sandzak, Korita, 1917, one specimen (Csiki, USNM); FRANCE: Gard, Vallerauge, July 1920, five specimens (A. Chobaut, USNM); GEORGIA: Abkhazia, N Gudauta, P'skhu, 1,700 m, 16 June 1984, 14 specimens (A. Konstantinov, USNM); 19 June 1984, one specimen (A. Konstantinov, USNM); GERMANY: Baden Wurttemberg, Michelwinnaden, July 1990, one specimen (M. Bergeal, BERC); Thüringen, Schleusingen, 2 July 1997, eight specimens (F. Fritzlar, FRIC); Thüringen, Stützenbrücken, 11 October 1996, one specimen (F. Fritzlar, FRIC); Thüringen, Triebes, 27 October 1998, nine specimens (Weigel, FRIC); IRAN: NW Iran, Tabriz, Sufian, 20–21 June 1970, one specimen (Exp. Nat. Mus. Praha, USNM); ITALY: Piemonte, Torino, Brunetta di Susa, 8 July 1981, two specimens (M. A. Alonso-Zarazaga, BAVC); POLAND: Gdansk, Rokitnica [Danzig, Müggenhahl], three specimens (USNM); PORTUGAL: Porto, one specimen (Nobre, MNCN); RUMANIA: Dobruja, Macin, Greci, two specimens (A. L. Montandon, USNM); RUSSIA: Bryansk, Unecha, Unecha River, 20 June 1981, two specimens (A. Konstantinov, USNM); Krasnodarskiy Kray, Krasnaya Polyana, 27–28 June 1982, two specimens (A. Konstantinov, USNM); Krasnodarskiy Kray, Sochi, Lazarevskoye, 16 November 1916, one specimen (USNM); Krasnodarskiy Kray, Tuapse, 16 June 1982, one specimen (A. Konstantinov, USNM); North Ossetia, Orjonikidze, 21 July 1979, one specimen (USNM); Smolensk, Temkino, Skotinino, 23 July 1980, 104 specimens (A. Konstantinov, USNM); SERBIA AND MONTENEGRO: Montenegro, Rozaj, 1917, one specimen (Cski, USNM); SLOVENIA: Postojna, Wiese, 16 August 1958, four specimens (Endrody-Younga, USNM); SPAIN: A Coruña, Sigüeiro, 4 June 1996, five specimens (A. Baselga, BASC); Albacete, Sierra de Segura, El Pardo, June 1903, one specimen (M. Escalera, MNCN); Cuenca, July 1906, one specimen (Arias, MNCN); Huesca, Bielsa, 20–26

August 1944, one specimen (MNCN); Huesca, Panticosa, three specimens (L. Báguena, MNCN); Huesca, Sallent, two specimens (MNCN); Lleida, Sierra de Cadi, August 1906, four specimens (Arias, MNCN); Lugo, Sierra de Ancares, Os Cabaniños, 8 June 1997, three specimens (A. Baselga, BASC); Lugo, Sierra de Caurel, A. Rogueira, 27 July 1997, one specimen (A. Baselga, BASC); Ourense, Carballiño, 13 September 1997, one specimen (A. Baselga, BASC); Pontevedra, Oia, Loureza, 20 September 1998, one specimen (A. Baselga, BASC); Pontevedra, Pontearreas, Prado, 9 May 1999, one specimen (A. Baselga, BASC); Pontevedra, Vila de Cruces, 12 June 1996, one specimen (A. Baselga, BASC); Teruel, Albarraacín, July 1906, two specimens (Arias, MNCN); UKRAINE: Krim, Bel'bek, 5 June 1897, one specimen (N. Kuznietsov); Poltava, 2 August 1915, one specimen (Ogloblin, USNM); UNITED KINGDOM: England, Sudbury, 1935, two specimens (F. D. Buck; USNM).

**Diagnosis.** Length 2.7–3.8 mm. *Pronotum*: sides not constricted basally, narrowly margined. Anterolateral callosity rounded, well developed and slightly asymmetrical. Surface covered with medium to moderately strong punctures on disc and basal region, with greater punctures in the antebasal transverse groove. Antebasal punctation always conspicuous, punctures as coarse as discal ones or very slightly finer (Fig. 5). *Elytra*: punctation completely seriate, or sometimes with some striae partially irregular because some punctures are duplicated or slightly disordered (especially in females). Punctures large and deep. Interstriae slightly convex, as wide as striae or slightly narrower in males, broader in females. Base of sixth elytral stria normally impressed, as deep as the other striae. *Aedeagus*: short, produced apically into a rounded denticle (Fig. 17). *Vaginal palpi*: relatively short and wide, tapering to the apex (Fig. 29a). In some specimens slightly longer, but never as much as in *N. motschulskii*. *Spermatheca*: as in Fig. 29b.

**Distribution.** Europe, Turkey, Caucasus, Iran.

*Neocrepidodera interpunctata* (Motschulsky)

(Figs. 6, 18, 30)

**Material Examined.** BELARUS: Gomel', Turov, 23 June 1980, one specimen (A. Konstantinov, USNM); Nalibokskaya Puscha, Lake Kroman', 31 June 1983, two specimens (Maxim., USNM); FINLAND: Hyvinkää, 27 July 1975, one specimen (I. Rutanen, BASC ex Döberl); Lappajärvi, 8 July 1985, one specimen (I. Rutanen, BASC ex Döberl); GERMANY: Schleswig-Holstein, Pobüll, 26 July 1977, one specimen (Lohse, BERC).

**Other Non-West Palaearctic Material.** RUSSIA: Khabarovskiy Kray, Bureinskiy Khrebet [Bureja Gebirge], one specimen (Radde, USNM); Kunashir Island, 24 July 1985, two specimens (Saluk, USNM); Sakhalin Island, 27 June 1985, one specimen (Saluk, USNM); Sakhalin Island, Gornozavodsk, 11 August 1992, two specimens (Konstantinov, USNM).

**Diagnosis.** Length 2.9–3.7 mm. *Pronotum*: subquadrate, slightly constricted antebasally, narrowly mar-

gined. Anterolateral callosity obtuse-angled, well developed and slightly asymmetrical. Surface covered with very coarse punctures on disc and slightly finer ones on basal region (Fig. 6). *Elytra*: striae completely irregular because punctures are duplicated and disordered (more strongly in females). Punctures large and deep. Interstriae slightly convex and narrower than double rows of punctures. Base of sixth elytral stria strongly impressed, deeper than the other striae. *Aedeagus*: almost parallel sided, produced apically into an acute point (Fig. 18). *Vaginal palpi*: poorly developed, extremely short and narrow (Fig. 30a). *Spermatheca*: as in Fig. 30b.

**Distribution.** Northern Europe, reaching Germany and Poland to the south, north of Asia, reaching Kazakhstan, China, and Korea to the south, Japan and the Kuril Islands to the east. The species is newly recorded for Belarus.

*Neocrepidodera bolognai* (Biondi)

(Figs. 7, 19, 31)

**Material Examined.** MOROCCO: Taza, [Cascade di = waterfalls of] Ras el Oued, 900 m, 15 May 1979, two specimens (PARATYPES, M. Biondi, BIOC).

**Diagnosis.** Length 3.6–4.0 mm. *Pronotum*: transverse, weakly constricted basally, narrowly margined. Anterolateral callosity rounded, well developed and almost symmetrical. Surface covered with large but shallow punctures on disc and basal region, with greater punctures in the antebasal transverse groove (Fig. 7). *Elytra*: striae completely irregular because punctures are duplicated and disordered (more strongly in females). Punctures fine. Interstriae flat and broader than double rows of punctures. Base of sixth elytral stria normally impressed, as deep as the other striae. *Aedeagus*: almost parallel sided, rounded at apex (Fig. 19). *Vaginal palpi*: large, relatively long and wide (Fig. 31a). *Spermatheca*: as in Fig. 31b.

**Distribution.** Morocco. This species is known only from its type locality, Ras el Oued.

*Neocrepidodera brevicollis* (J. Daniel)

(Figs. 8, 20, 32)

**Material Examined.** AUSTRIA: Steiermark [Stiria], Graz, one specimen (USNM); BELARUS: Nalibokskaya Puscha, Kletitse, 27 July 1982, three specimens (Buga, USNM); FRANCE: Ain, Balan, 2 September 1991, one specimen (C. Dufay, MHNL); Ain, Colomieu, 10 September 1991, one specimen (C. Dufay, MHNL); Savoie, Chindrieux, 18 June 1990, one specimen, 29 July 1990, one specimen (C. Dufay, MHNL); ITALY: Abruzzo, L'Aquila, Campo di Rovere, 9 July 2003, two specimens (A. Zuppa and P. D. Alessandro, BIOC); Abruzzo, L'Aquila, M. Sirente, Rovere, 25 June 1974, two specimens (G. Osella, BIOC); SPAIN: A Coruña, A Capela, Caaveiro, 27 July 1999, six specimens (A. Baselga, BASC); León, Villablino, five specimens (MNCN); León, Villar de Santiago, one specimen (MNCN).

**Diagnosis.** Length 3.4–4.5 mm. *Pronotum*: transverse, markedly constricted basally, narrowly margined. Anterolateral callosity slightly transverse, distinctly asymmetrical, rounded anteriorly and angulose posteriorly. Surface covered with coarse punctures on disc and basal region, with greater punctures in the antebasal transverse groove (Fig. 8). *Elytra*: striae irregular because punctures are duplicated and disordered (more strongly in females). Punctures very large but relatively shallow. Interstriae slightly convex and narrower than double rows of punctures. Base of sixth elytral stria strongly impressed, deeper than the other striae. *Aedeagus*: short, constricted basally and rounded apically (Fig. 20). *Vaginal palpi*: short and broad, basal membranous region poorly developed (Fig. 32a). *Spermatheca*: as in Fig. 32b.

**Distribution.** Europe, reaching Denmark and Belarus to the north, Spain and Italy to the south. The citations from Belarus and Spain are new national records and major range extensions for *N. brevicollis*.

*Neocrepidodera transversa* (Marshall)

(Figs. 9, 21, 33)

**Material Examined.** AUSTRIA: Neusiedl, Edmundshof, 25 August 1969, one specimen (M. Döberl; USNM); Neusiedl, Zurndorf, 25 August 1969, one specimen (M. Döberl; USNM); BELARUS: Gomel', Turov, 23 June 1980, four specimens (A. Konstantinov, USNM); GERMANY: Thüringen, Alperstedt, 16 August 1996, seven specimens (F. Fritzlar, FRIC); Thüringen, Sülzenbrücken, 11 October 1996, two specimens (F. Fritzlar, FRIC); Thüringen, Triebes, 27 October 1998, nine specimens (Weigel, FRIC); ITALY: Torino, Torrente di [T.] Stura, seven specimens (G. della Beffa, MNCN); ROMANIA: Bucuresti [Bucarest], one specimen (A. L. Montandon, MNCN); RUSSIA: Stavropol'skiy Kray, Essentuky, 20 July 1986, one specimen (I. K. Lopatin, USNM); SLOVENIA: Ljubljana (Gravovsky, USNM); SPAIN: A Coruña, Oroso, 5 July 1997, five specimens (A. Baselga, BASC); Albacete, Riópar, 25 July 1926, two specimens (M. Escalera, MNCN); Almería, Huerca Overa, four specimens (MNCN); Almería, Sierra Nevada, Paterna del Río, 15 July 1995, seven specimens (P. Barranco, BAVC); Burgos, Hontoria del Pinar, 9 August 1978, five specimens (C. Rey, MNCN); Cantabria, San Pedro de Bedoya, 17–30 August 1990, two specimens (MNCN); Granada, La Sagra, 1900, one specimen (M. Escalera, MNCN); Huesca, Hecho, 9 August 1989, five specimens (M. A. Alonso-Zarazaga, MNCN); Huesca, Zuriza, 1 July 1953, 12 specimens (MNCN); León, La Ercina, five specimens (Cendrero, MNCN); Lugo, Baleira, Pousada, 17 June 1999, one specimen (A. Baselga, BASC); Lugo, Chantada, Belesar, 22 August 1999, one specimen (A. Baselga, BASC); Lugo, Sierra de Ancares, Cancelada, 18 October 1998, one specimen (A. Baselga, BASC); Lugo, Sierra de Ancares, Rao, 4 July 1998, one specimen (A. Baselga, BASC); Madrid, Montejo de la Sierra, 22 specimens (C. Bolívar and M. Escalera, MNCN); Ourense, A. Mezquita, A Canda, 16 July 2000, one specimen (A. Baselga, BASC); Ourense,

Castro Caldelas, 22 July 2000, one specimen (A. Baselga, BASC); Ourense, Riós, Progo, 12 June 1999, one specimen (A. Baselga, BASC); Ourense, Vilarinho de Conso, Entrecinsa, 12 June 1999, one specimen (A. Baselga, BASC); Teruel, Bronchales, July 1956, 20 specimens (MNCN); Toledo, Quero, June 1909, four specimens (MNCN); UKRAINE: Kharkov, Lozoven'ka, 31 July 1948, three specimens (I. Lopatin, USNM); Krim, Bel'bek, 18 August 1897, one specimen (Kusnietzov, USNM).

**Diagnosis.** Length 3.5–5.0 mm. *Pronotum*: very variable, in most specimens it is hardly transverse and very slightly constricted basally (Fig. 9), but in some specimens it is distinctly transverse and markedly constricted basally as in *N. brevicollis*. Anterolateral callosity markedly transverse, distinctly asymmetrical, rounded anteriorly and angulose posteriorly. Surface covered with coarse punctures on disc, fine in basal region, with greater punctures in the antebasal transverse groove (Fig. 9). In some specimens the discal punctation is quite fine, similar to *N. impressa*. *Elytra*: striae irregular because punctures are duplicated and disordered (more strongly in females). Punctures large and deep. Interstriae slightly convex and narrower than double rows of punctures. Base of sixth elytral stria strongly impressed, deeper than the other striae. *Aedeagus*: large, subparallel basally and acutely pointed apically (Fig. 21) *Vaginal palpi*: relatively long and slender, moderately curved, tapering to the apex (Fig. 33a). *Spermatheca*: as in Fig. 33b.

**Distribution.** Europe, Turkey, Cyprus, Caucasus, Iran.

*Neocrepidodera impressa* (F.)  
(Figs. 10, 22, 34)

**Material Examined.** ALBANIA: Spolate [Spalata], one specimen (Apfelbeck, USNM); ALGERIA: Biskra, May 1899, one specimen (Mol de Boissy, BERC); Blida, Chrea, 20 June 1979, five specimens (S. Doguet, BERC); Boumerdes, Mandoura, Oued Isser, 17 April 1988, one specimen (Colonelli, BIOC); Khemis Miliana [Affreville], 19 June 1955, two specimens (R. Guerroumi, BERC); FRANCE: Camargue, 18 specimens (MNCN); Corse, two specimens (MNCN); ITALY: Abruzzo, L'Aquila, one specimen (USNM); Sardegna, Sedilo, 21 May 1995, one specimen (Angelini, BERC); MOROCCO: Agadir, Oued Massa, 6 May 1983, one specimen (S. Doguet, DOGC); Azrou, Khenifra, one specimen (A. Thery, DOGC); Azrou, Ouiuane, two specimens (A. Thery, DOGC); Larache, three specimens (M. Escalera, MNCN); Sebou, one specimen (A. Thery, DOGC); Tanger, five specimens (M. Escalera, MNCN); Tanger, 1897, two specimens (MNCN); Tanger, one specimen (BERC); Tetouan, M'dik [Rincón], two specimens (MNCN); Tetouan, Negron [Negro], one specimen (M. Escalera, MNCN); PORTUGAL: Algarve, Santa Bárbara de Nexe, July 1973, one specimen (H. Coiffait, DOGC); Estremadura, Batalha, Alcacer do Sal, 11 June 1989, one specimen (J. Péletier, J. Péricart and A. Matocq, DOGC); SPAIN: A Coruña, Ribeira, Parque

Natural de Corrubedo, 4 October 1997, nine specimens (A. Baselga, BASC); A Coruña, Ribeira, Aguiño, 18 August 1976, two specimens (F. Novoa, BASC); Almería, Láujar, one specimen (M. Mendizábal, MNCN); Cádiz, Chiclana, 12 September 1937, one specimen (Junco, MNCN); Cádiz, Tarifa, May 1903, one specimen (M. Escalera); Cádiz, Tarifa, 18 May 1952, one specimen (H. Coiffait, DOGC); Cádiz, Tarifa, 21 April 1995, one specimen (M. Bergeal, BERC); Granada, Guadix, one specimen (MNCN); Islas Baleares, Mallorca, Muro, Parque Natural de S'Albufera, 16 May 1996, one specimen (M. A. Alonso-Zarazaga and M. Sánchez-Ruiz, MNCN); Islas Baleares, Menorca, two specimens (MNCN); Madrid, eight specimens (Pérez Arcas, MNCN); Murcia, Cartagena, three specimens (MNCN); Málaga, Ardales, Embalse del Conde, 20 April 1996, one specimen (S. Doguet, DOGC); Málaga, El Burgo, Arroyo de la Fuensanta, 31 May 1983, one specimen (G. Bastazo and J. M. Vela, BAVC); Málaga, Los Prados, 20 April 1986, 13 specimens (G. Bastazo and J. M. Vela, BAVC); Pontevedra, Vigo, Islas Cíes, Isla Norte, 4 July 1997, six specimens (A. Baselga, BASC); Pontevedra, O. Rosal, Tabagón, 20 September 1998, two ex (A. Baselga, BASC); Segovia, Villacastín, two specimens (MNCN); Toledo, three specimens (G. Menor, MNCN); Valencia, one specimen (MNCN); Zaragoza, Laguna de Gallocanta, 17 July 1981 (J. Serrano, MNCN); TUNISIA: Tunisia, 1904 (Ujhelyi, USNM).

**Diagnosis.** Length 3.4–4.5 mm. *Pronotum*: transverse, slightly constricted basally, narrowly margined. Anterolateral callosity transverse, distinctly asymmetrical, rounded anteriorly and toothed posteriorly. Surface covered with minute punctures on disc and basal region (Fig. 10). *Elytra*: striae irregular because punctures are duplicated and disordered (more strongly in females), only basal region of striae almost completely ordered. Punctures relatively small and shallow. Interstriae completely flat and clearly broader than double rows of punctures. Base of sixth elytral stria impressed, deeper than the other striae. *Aedeagus*: short, strongly constricted subapically, produced into a denticle at apex (Fig. 22). *Vaginal palpi*: long and slender, almost straight (Fig. 34a). *Spermatheca*: as in Fig. 34b.

**Remarks.** Two subspecies of *N. impressa* have been previously considered. *Neocrepidodera impressa obtusangula* (J. Daniel) is distributed in southeastern Europe and the Anatolian Region. It is distinguished from the nominotypical subspecies by the posterior angle of anterolateral callosity, which is rounded instead of toothed, and by the sides of pronotum being more rounded than in *N. impressa impressa*. We could study only one female, from Cyprus: Stavros [Stavro vuni] (Bordan, USNM). The spermatheca and vaginal palpi do not differ from the typical form, nor do male genitalia (Daniel 1904). In our opinion the lack of genital diagnostic characters makes appropriate the subspecific status proposed by Daniel (1904), but the analysis of more specimens is needed.

*Neocrepidodera peregrina* (Harold) was considered a subspecies of *N. impressa* since Daniel (1904). The



marked external and genital differences (see below) and their sympatric distributions in North Africa indicate that both taxa are different species.

**Distribution.** Southern Europe, reaching England and Germany, North Africa, Israel, Syria, Turkey.

*Neocrepidodera peregrina* (Harold), stat. rev  
(Figs. 11, 23, 35)

**Material Examined.** ALGERIA: Annaba, Seraidi, Edough, 6 September 1971, two specimens (Constantin, DOGC); Guelma, Djebel Nador, Hamman N'Bails, 8 May 1968, one specimen (S. Doguet, DOGC); Kabylie, Mecla, 1908, one specimen (BERC); Khemis Miliana [Affreville], 19 June 1955, one specimen (R. Guerroumi, BERC); Tizi Ouzou, 15 June 1971, one specimen (J. Horak and H. Hoffer, BERC); Yakouren, 21–23 June 1971, one specimen (J. Horak and H. Hoffer, BERC); TUNISIA: Ayn ad Darahim [Ain Draham], 24 June 1976, two specimens (Manger and Muhle, FRIC); Menzel Bourguiba [Bourgiba], 5 June 1982, one specimen (H. Malicky, BERC).

**Diagnosis.** Length 4.2–5.0 mm. Pronotum: transverse, slightly constricted basally, narrowly margined. Anterolateral callosity transverse, distinctly asymmetrical, rounded anteriorly and toothed posteriorly. Surface covered with extremely minute punctures on disc and basal region (Fig. 11). *Elytra*: punctuation almost completely confused because irregular double rows of punctures are broader than interstriae. Punctures relatively small and shallow. Base of sixth elytral stria slightly impressed. *Aedeagus*: slightly constricted antepically, apex rounded and produced into an acute denticle (Fig. 23). *Vaginal palpi*: relatively short, slightly curved (Fig. 35a). *Spermatheca*: as in Fig. 35b.

**Distribution.** Algeria and Tunisia.

*Neocrepidodera precaria* Baselga and Novoa, sp. nov  
(Figs. 12, 24, 36)

**Type Material.** HOLOTYPE MALE: SPAIN: Málaga, El Burgo, Arroyo [Ayo] de la Fuensanta, 600 m, UTM grid 30SUF2672, 12 October 1983 (G. Bastazo). Holotype is deposited in the Museo Nacional de Ciencias Naturales, Madrid, Spain (Type Catalog No. 9571). PARATYPES: MOROCCO: [without any label], two specimens (MNCN); Tanger, one specimen (BERC); SPAIN: Córdoba, road between Cabra and Priego, Arroyo del Palancar, 12 June 1994, one specimen (G. Bastazo and J. M. Vela); Málaga, one specimen (A. Sanz, MNCN); Málaga, El Burgo, Arroyo de la Fuensanta, 600 m, UTM grid 30SUF2672, 12 October 1983, four specimens (G. Bastazo, BAVC); Málaga, El Burgo, Arroyo de la Fuensanta, UTM grid 30SUF2672, 600 m, 12 October 1983, one specimen (G. Bastazo, MNCN); Málaga, Pantano del Chorro, 22 September 1978, one specimen (J. M. Ávila, BAVC); Málaga, Antequera, Sierra de las Cabras, 1,000 m, 16 September 1981, two specimens (G. Bastazo and J. M. Vela, BAVC).

**Etymology.** We name this new species for Precarios, the Spanish Federation of Young Researchers (Federación de Jóvenes Investigadores-Precarios, www.precarios.org), in tribute to its activity to improve the Spanish Research System and especially the employment rights for young researchers.

**Diagnosis.** Length 4.5–5.5 mm. *Pronotum*: transverse, slightly constricted basally, narrowly margined. Anterolateral callosity transverse, distinctly asymmetrical, rounded anteriorly and angled posteriorly (but not toothed). Surface covered with medium sized punctures on disc, minute in basal region (Fig. 12). *Elytra*: punctuation almost completely confused because irregular double rows of punctures are almost contiguous, much broader than interstriae. Punctures relatively large and deep. Base of sixth elytral stria very slightly impressed. *Aedeagus*: extremely large, subparallel sided, apex subtriangular shaped with denticle poorly developed (Fig. 24). *Vaginal palpi*: very long, slightly curved (Fig. 36a). *Spermatheca*: as in Fig. 36b.

**Description.** Length 4.5–5.5 mm. Body convex, about two times longer than wide. Color reddish brown. *Head*: slightly convex. Labrum bearing three pairs of setae in anterior margin. Clypeus bearing four pairs of long setae in anterior margin and many other shorter ones. Frontal ridge between antennal calli wide. Antennal calli oval, hardly delineated from vertex. Vertex smooth and shiny, with a strong deep seta-bearing puncture near each eye. Third antennomere  $\approx 1.5$  times longer than second, very slightly longer than fourth and shorter than fifth. *Pronotum*: provided with an antebasal transverse furrow delimited laterally by two longitudinal impressions, 1.3–1.4 times broader than long, widest at middle, slightly constricted basally, narrowly margined. Anterolateral callosity transverse, distinctly asymmetrical, rounded anteriorly and angled posteriorly. Surface shiny, covered with medium sized punctures on disc, minute in basal region (Fig. 12). *Elytra*: moderately convex,  $\approx 1.4$  times longer than broad, widest at middle. Humeral callus well developed, macropterous. Lateral margins explanate, apex obtuse angled. Surface shiny. Punctuation arranged in 10 completely irregular double rows, scutellar row short. Punctures, large and deep. Interstriae covered with extremely minute micropunctures, flat and narrow, so that irregular double rows of punctures are almost contiguous and thus punctuation is almost completely confused. Base of sixth elytral stria impressed, deeper than the other striae, delimiting interiorly the humeral callus. *Aedeagus*: extremely large, subparallel sided, apex subtriangular shaped with denticle poorly developed (Fig. 24). *Vaginal palpi*: very long, slightly curved (Fig. 36a). *Spermatheca*: as in Fig. 36b.

**Remarks.** The new species is similar to *N. peregrina* but can be distinguished by its large size, and especially by the size of punctures of pronotum and elytra, the shape of anterolateral callus of pronotum, male and female genitalia.

**Distribution.** Northern Morocco and southern Spain.

**Discussion**

In the Western Palaearctic region, there are 12 species belonging to these two groups of species. Following Biondi (1989), and taking into account the new taxa, four species should be included in the *N. impressa* group (*N. impressa*, *N. transversa*, *N. peregrina*, and *N. precaria*), and those remaining in the *N. ferruginea* group (*N. ferruginea*, *N. crassicornis*, *N. hispanica*, *N. carolinae*, *N. motschulskii*, *N. interpunctata*, *N. bolognai*, and *N. brevicollis*). However, in our opinion, *N. brevicollis* belongs to the species group of *N. impressa* by the asymmetrical anterolateral callosity of pronotum (rounded anteriorly and angled posteriorly), as well as the shape of pronotum, aedeagus, and vaginal palpi.

The taxonomy of both groups involves serious difficulties due to the strong morphological resemblance among species, the moderate intraspecific variation of external characters and also the sympatric occurrence of several taxa. For this reason, the proposed key contains several features in each couplet, including always male and female genitalia. The external characters have been selected because they are stable across the studied material. However, exceptional individuals have been observed in some taxa (i.e., specimens of *N. crassicornis* with stronger pronotal punctation, specimens of *N. transversa* with pronotum constricted basally), so that the dissection of genital structures is almost indispensable. This need was previously indicated by Doguet (1994), but only the spermathecae were available for females, making thus an accurate identification of females impossible for sympatric close species (i.e., *N. motschulskii*/*N. ferruginea*, *N. crassicornis*/*N. ferruginea*, and *N. transversa*/*N. brevicollis*). The study of vaginal palpi (Figs. 15–36) resolves this previous taxonomic problem, allowing a diagnostic precision similar to that of aedeagi (Figs. 13–24).

The recognition of two new species is supported by both external and genital characters. In *N. carolinae*, there are two excellent external diagnostic characters: the anterolateral callosity of pronotum well developed, strongly produced anteriorly instead of poorly developed (Figs. 1–3), and the base of sixth elytral stria strongly impressed, deeper than the other striae instead of normally impressed. These two features, as well as the subtriangular apex of aedeagus and the shape of vaginal palpi, distinguish this new species from both *N. crassicornis* and *N. hispanica* (Figs. 13–15, 25–27). By the large and deep elytral punctures, *N. carolinae* also can be separated from *N. crassicornis*. In *N. precaria*, the size of pronotal and elytral punctures, and the shape of anterolateral callosity of pronotum (Figs. 11–12) are the external diagnostic features that separate the new species from *N. peregrina*. The genital ones are the subparallel sided large aedeagus and the long and slender vaginal palpi (Figs. 23–24, 35–36).

*N. hispanica* and *N. peregrina* are raised from the subspecific status based on their stable differences with *N. crassicornis* and *N. impressa*, respectively. External structures reported in the diagnoses and key, and especially male and female genitalia, show con-

stant diagnostic characters in all the specimens we have studied. In our opinion, the absence of intermediate states in the cited characters and the lack of specimens of doubtful identification due to contradictory characters make the specific status more appropriate for both taxa.

Regarding the position of these two groups within the genus, the cladistic analysis carried out by Biondi (1989) is not easy to interpret. The Wagner parsimony method supplies an unrooted consensus tree joining the taxa here studied in a clade supported by >50% of trees. This clade could be monophyletic or paraphyletic, due to the unrooted condition of the tree. The Camin–Sokal rooted consensus tree shows three basal clades, one supported by >50% of trees for *N. impressa* and *N. transversa*, and two more clades for the remaining species of the *N. impressa* and *N. ferruginea* groups, supported by a percentage of trees lower than 50%. This basal position could be because of the difficulty to establish the ancestral state of characters and the “ingroup comparison” method used by Biondi (1989). In our opinion, opposed to Biondi (1989), comparing *Neocrepidodera* with close genera (as *Orestia* Germar, *Crepidodera* Chevrolat, and *Ochrosia* Foudras), the plesiomorphic states for elytral punctation and the shape of anterolateral callosity, for example, should be completely ordered striae and callosity toothed, respectively. Taking into account the extreme importance of an accurate establishment of the character state polarity, further analysis is needed to clarify the phylogenetic relations within *Neocrepidodera*.

**Key to the *Neocrepidodera* of the *N. ferruginea* and *N. impressa* groups from the West Palaearctic region**

1. Elytral striae completely or almost completely regular . . . . . 2  
    Elytral striae irregular . . . . . 6
2. Discal punctures of pronotum fine (Figs. 1–3).  
    Vaginal palpi parallel sided or slightly enlarged antepically (Figs. 25–27) . . . . . 3  
    Discal punctures of pronotum moderately large to coarse (Figs. 4–5). Vaginal palpi tapering to the apex (Figs. 28–29) . . . . . 5
3. Elytra with stria punctures small and shallow.  
    Aedeagus larger, apical expansion reaching about one-third of its length, apex broadly subtriangular or produced into an obtuse denticle (Fig. 13). Basal membranous region of vaginal palpi strongly elongated (Fig. 25) . . . . . *N. crassicornis* (Faldermann)  
    Elytra with stria punctures large and deep. Aedeagus shorter, apical expansion reaching about one fourth of its length. (Figs. 14–15). Basal membranous region of vaginal palpi short (Figs. 26–27) . . . . . 4
4. Anterolateral callosity of pronotum poorly developed, almost symmetrical (Fig. 2). Base of sixth elytral stria normally impressed, as deep as the other striae. Apex of aedeagus

- wide rounded, produced into an obtuse denticle (Fig. 14). Vaginal palpi as in Fig. 26. . . . . *N. hispanica* (J. Daniel)
- Anterolateral callosity of pronotum well developed, asymmetrical because it is strongly produced anteriorly (Fig. 3). Base of sixth elytral stria strongly impressed, deeper than the other striae. Apex of aedeagus almost triangular, forming no denticle (Fig. 15). Vaginal palpi as in Fig. 27. . . . . *N. carolinae* sp. nov.
5. Base of sixth elytral stria strongly impressed, deeper than the other striae. Sides of pronotum constricted basally, discal punctures coarse and deep, antebasal punctures markedly finer than discal ones (Fig. 4). Aedeagus produced apically into a very acute point (Fig. 16). Vaginal palpi long and slender (Fig. 28) . . . . . *N. motschulskii* (Konstantinov)
- Base of sixth elytral stria normally impressed, as deep as the other striae. Sides of pronotum not constricted basally, discal punctures moderately large but shallow, antebasal punctures as large as discal ones or very slightly finer (Fig. 5). Aedeagus short, produced apically into a rounded denticle (Fig. 17). Vaginal palpi relatively short and wide (Fig. 29) . . . . . *N. ferruginea* (Scopoli)
6. Anterolateral callosity of pronotum more or less angulose but almost symmetrical (Figs. 6-7). . . . . 7
- Anterolateral callosity of pronotum distinctly asymmetrical, rounded anteriorly and angulose posteriorly (Figs. 8-12) . . . . . 8
7. Pronotum subquadrate (Fig. 6). Elytral striae punctures coarse, interstriae narrow and convex. Aedeagus apically produced into an acute denticle (Fig. 18). Vaginal palpi poorly developed, extremely short and narrow (Fig. 30) . . . . . *N. interpunctata* (Motschulsky)
- Pronotum clearly transverse (Fig. 7). Elytral striae punctures fine, interstriae broad and flat. Aedeagus rounded at apex (Fig. 19). Vaginal palpi large, relatively long and wide (Fig. 31). . . . . *N. bolognai* (Biondi)
8. Discal punctures of pronotum coarse (Figs. 8-9). Elytral interstriae at least slightly convex . . . . . 9
- Discal punctures of pronotum fine (Figs. 10-12). Elytral interstriae completely flat. . . 10
9. Anterolateral callosity slightly transverse (Fig. 8). Aedeagus short, constricted basally and rounded apically (Fig. 20). Vaginal palpi short and broad (Fig. 32) . . . . . *N. brevicollis* (J. Daniel)
- Anterolateral callosity of pronotum markedly transverse (Fig. 9). Aedeagus large, subparallel basally and acutely pointed apically (Fig. 21). Vaginal palpi relatively long and slender (Fig. 33). . . . . *N. transversa* (Marshall)
10. Elytral striae irregular but distinct, punctures arranged in irregular double rows narrower than interstriae. Aedeagus short, strongly constricted anteapically, produced into a denticle at apex (Fig. 22). Vaginal palpi slender (Fig. 34) . . . . . *N. impressa* (F.)
- Elytral striae almost indistinct, punctuation confused because irregular rows are broader than interstriae, sometimes almost contiguous. Aedeagus large, slightly constricted anteapically or subparallel sided (Figs. 23-24). Vaginal palpi broad (Figs. 35-36) . . . . . 11
11. Discal punctures of pronotum extremely minute and shallow, posterior angle of anterolateral callosity strongly toothed (Fig. 11). Aedeagus slightly constricted anteapically, apex rounded and produced into an acute denticle (Fig. 23). Vaginal palpi relatively short (Fig. 35) . . . . . *N. peregrina* (Harold)
- Discal punctures of pronotum relatively large and deep, posterior angle of anterolateral callosity distinct but not toothed (Fig. 12). Aedeagus extremely large, subparallel sided, apex subtriangular shaped with denticle poorly developed (Fig. 24). Vaginal palpi very long (Fig. 36) . . . . . *N. precaria* sp. nov.

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