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Redescription of *Aleochara* (*Coprochara*) *signaticollis* FAIRMAIRE & GERMAIN, 1861, an overlooked species. 3rd taxonomic contribution to the subgenus *Coprochara* MULSANT & REY, 1874 of the genus *Aleochara* GRAVENHORST, 1802 (Coleoptera: Staphylinidae)

Ch. MAUS

Abstract

Aleochara (*Coprochara*) *signaticollis* FAIRMAIRE & GERMAIN, 1861 (Coleoptera: Staphylinidae), previously treated as a synonym of *A.* (*C.*) *notula* ERICHSON, 1839, is recognized as a distinct species and redescribed. A lectotype is designated for *A. signaticollis*, and types of *A. notula* and its synonyms are investigated. The genitalia of both species are illustrated, and distinguishing characters are given; the distribution of *A. notula* and *A. signaticollis* is recorded. The phylogenetic relationships of *A. signaticollis* are discussed.

Key words: Coleoptera, Staphylinidae, Aleocharinae, *Aleochara signaticollis*, *Aleochara notula*, *Coprochara*, taxonomy, systematics, distribution, South America.

Introduction

Due to its unusual, parasitoid habits and its economic importance, the genus *Aleochara* has been the subject of numerous ecological studies for many decades (compiled by PESCHKE & FULDNER 1977; MAUS et al. 1998). There are, however, many questions remaining regarding the taxonomy, systematics and phylogeny of this genus. Among the subgenera of *Aleochara*, *Coprochara* has been one of the most difficult groups. In this monophyletic subgenus, extraordinary infraspecific variation and interspecific similarity have complicated taxonomic, faunistic and ecological studies. Within the last fifteen years, some investigations have contributed to a better understanding of the taxonomy of this subgenus (KLIMASZEWSKI 1984; LOHSE 1986; KLIMASZEWSKI & JANSEN 1994; MAUS 1998, 1999, 2000; MAUS & ASHE 1998), but some problems still remain to be solved.

Our knowledge of the South American *Aleochara* fauna is still quite incomplete (see KLIMASZEWSKI & MAUS 1999). This is also true for the subgenus *Coprochara*. *Aleochara notula* has been considered a common species distributed through South, Central and southern North America for a long time (e.g. FAUVEL 1901; FENYES 1920; BERNHAUER & SCHEERPELTZ 1926; KLIMASZEWSKI 1984). The investigation of some South American *A. notula* material showed that "*A. notula*" is in fact a complex of two very similar species which are nearly identical externally but that can readily be distinguished by the male and female genitalia.

Material and Methods

The investigated specimens were dissected, with the genitalia embedded in water soluble polyvinyl pyrrolidone and mounted on a transparent plastic microslide attached to the pins with the specimens. Drawings of the genitalia were made using a Leitz Dialux microscope with a drawing tube. Mann-Whitney U-Tests were carried out in order to determine statistic significance of interspecific differences using StatView 4.01.

The morphological terminology used (especially regarding male and female genitalia) follows KLIMASZEWSKI (1984) and MAUS (1998). Labels of type specimens are cited using quotation marks separating different labels, and a slash (/) separating different lines on one label.

Abbreviations

Institutions:

CNC = Canadian National Collections of Insects, Arachnids and Nematodes, Ottawa, Ontario (Canada); **DEI** = Deutsches Entomologisches Institut, Eberswalde (Germany); **FMNH** = The Field Museum, Chicago, Illinois (USA); **IBC** = Instituto de Biologia, UNICAMP, Campinas, São Paulo (Brasil); **IRSNB** = Institut Royal des Sciences Naturelles de Belgique, Bruxelles (Belgium); **MNHUB** = Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin (Germany); **NHMB** = Naturhistorisches Museum Basel (Switzerland); **NHML** = The Natural History Museum, London (UK); **NMW** = Naturhistorisches Museum Wien, Vienna (Austria); **SEM** = Snow Entomological Museum, Lawrence, Kansas (USA); **USNM** = National Museum of Natural History, Smithsonian Institution, Washington D.C. (USA); **ZIF** = Zoologisches Institut der Universität Freiburg (Germany); **ZSM** = Zoologische Staatssammlung, Munich (Germany).

Morphometric Data:

WHP = quotient width head : width pronotum; **WPE** = quotient width pronotum : width elytra; **PLW** = quotient length pronotum : width pronotum; **LPE** = quotient length pronotum : length elytra; **8AWL** = quotient width 8th antennal segment : length 8th antennal segment; **L** = body length; **LWA** = body length without abdomen (measured from labrum to sutural angle).

Results and Discussion

An investigation of larger series of *A. notula* from South, Central and North America showed that there are two distinctly different morphotypes of genitalia among this material: one morphotype with an aedeagal median lobe with the flagellum simply reflexed in the bulbus and with a produced apical tip of sclerite Z with a ventral projection, and with a spermatheca with a slenderly elongate capsule and a duct with few coils, and a second type with a flagellum which is coiled in the bulbus, and without a ventral projection of sclerite Z, and with a spermatheca with a spherical capsule and a duct with more coils. The quality and consistence of these characters clearly showed that these morphotypes represent different species, one of which was previously overlooked. The result of the investigation of the types of *A. notula* and its synonyms is that the name of the species with the genitalia of the first morphotype is *A. notula* ERICHSON, 1839 and that the species with genitalia of the second morphotype is *A. signaticollis* FAIRMAIRE & GERMAIN, 1861. This taxon was synonymized with *A. notula* (at the latest) by SHARP (1883) and has been classified as a synonym of this species since then. Most *A. signaticollis* specimens found in several collections were labeled as *A. notula*.

Aleochara (*Coprochara*) *notula* ERICHSON, 1839

Aleochara notula ERICHSON, 1839: 167

TYPE MATERIAL: Lectotype (♀):"5574", "notula / Er. / St. Thom. Mor." [="St. Thomas" and "Moritz"], "Al. / notula Er. / det. R. Pace 1984", "Lectotype ♀ / Aleochara notula / Erichson / des. J. Klimaszewski 1982", "Aleochara / (Coprochara) / notula Erich. / det. J. Klimaszewski" (MNHUB).

Aleochara duplicata ERICHSON, 1839: 167

TYPE MATERIAL: Holotype (♂):"5575", "Columbia / Moritz / Nr. 5575", "duplicata / Er.", "Type", "Zool. Mus. / Berlin", "A. bimaculata Grav. / Zb. Likovsky det. 66", "Al. / notula Er. / det. R. Pace 1984", "Aleochara / (Coprochara) / notula Erich. / det. J. Klimaszewski" (MNHUB).

Baryodma nanella CASEY, 1906: 160

TYPE MATERIAL: Holotype (♂):"Brownsville / Texas / Wickham", "Type USNM / 39662" "nanella / Csy." "Holotype / Compared by / J. Klimaszewski" [printed text "Homotype" changed into "Holotype" in writing] (USNM).

Baryodma nitidicollis CASEY, 1906: 160, nec SOLIER, 1849

TYPE MATERIAL: Lectotype (♂):"Tex", "Type USNM / 39661", "nitidicollis Csy", "Casey / bequest / 1925", "♀" "Lectotype / Baryodma / nitidicollis Casey / J. Klimaszewski / des. 1981". Paralectotypes: 3 ex: "Brownsville / Texas / Wickham", "Casey / bequest / 1925", "nitidicollis [individually numbered 2, 4, and 13], Paratype USNM / 39661". 8 ex: "Tex", "Casey / bequest / 1925", "nitidicollis [individually numbered 5 to 12], Paratype USNM / 39661". 1 ex: "Cal", "Casey / bequest / 1925", "nitidicollis - 3, Paratype USNM / 39661". 1 ex: "Mex", "Casey / bequest / 1925", "? nitidicollis / Type USNM / 39661".

Aleochara pernix BLACKWELDER, 1944: 167

TYPE MATERIAL: none (nomen novum).

ADDITIONAL MATERIAL EXAMINED:

USA: 2 ex., Florida: Monroe Co.: Big Pine Key, 18.XII.1986, leg. Klimaszewski (SEM). 2 ex., Texas: Brazos Co., X.1973, leg. J.S. Ashe (SEM). 3 ex., ibid., 13.I.1935 and 18.XI.1936, leg. Robinson (SEM). 4 ex., Texas, without exact collection data (SEM). 4 ex., Arizona: Gila Co., Roosevelt Lake, 680 m, VII.1976, leg. Hammond (BMNH). 1 ex., Arizona: Graham Co., Aravaipa Canyon, 960 m, VII.1976, leg. Hammond (BMNH). 3 ex., Arizona: Sta. Cruz Co.: Rio Rico, 13.VII.1991, leg. Warner (SEM). 2 ex., California, Yuma, 1910-12, ex coll. Fenyes (DEI). 3 ex., Kansas: Jefferson Co.: Perry Lake, 27.VI.1992, leg. Lingafelter & Dannoff-Burg (SEM). 2 ex., Kansas: Dickinson Co.: Elmo, 19.X.1997, leg. Maus (ZIF). 5 ex., without exact location ("Nordamerika") (coll. Kraatz: DEI). **Mexico:** 1 ex., Chiapas: El Aguacero, 680 m, 18.-21.VI.1990, leg. Werner (SEM). 1 ex., Chiapas: El Aguacero, 510 m, 6.VI.1991, leg. Ashe (SEM). 2 ex., Puebla: Tehuitzingo, VII.1974, leg. Ashe (ZIF). 1 ex., Quintana Roo: Cancun, I.1987, leg. Genier & Bertrand (ZIF). 2 ex., Morelos: SE Cuernavaca, 6.VII.1955, leg. Selander (FMNH). 1 ex., Veracruz: Las Vigas, leg. Hoege, ex coll. Sharp (FMNH). 1 ex., Baja California del Norte: Mexicali (coll. Kraatz: DEI). **El Salvador:** 1 ex., La Libertad, 3.-5.V.1971, leg. Peck (CNC). **Costa Rica:** 1 ex., Puntarenas: Esparta, 24.I.1943 (coll. Bierig: FMNH). 1 ex., Puntarenas: Mata de Limón, 17.IV.1969, leg. Kazan (ZIF). 9 ex., Puntarenas: Uvieta, leg. Peschke (ZIF). **Honduras:** 2 ex., Francisco Morazan: E Zamorano, 870 m, 8.VI.1994, leg. Ashe & Brooks (SEM). **Guatemala:** 2 ex., Retalhuleu: Champerico, leg. Champion, ex coll. Sharp (FMNH). **Cuba:** 2 ex., Ciudad de la Habana: La Lisa, 10.X.1928 (coll. Bierig: FMNH). 1 ex., Ciudad de la Habana: Punta Brava, 25.VII.1928 (coll. Bierig: FMNH). 1 ex., Ciudad de la Habana: Cojimar, 27.VII.1928 (coll. Bierig: FMNH). 1 ex., La Habana: Santa Cruz del Norte, 22.VIII.1928 (coll. Bierig: FMNH). 1 ex., Guantánamo: Jamaica, 8.VIII.1928 (coll. Bierig: FMNH). 7 ex., Playa Marianas, 19.VII.1928, 24.VII.1928, 1.VIII.1928, 2.IX.1928, 19.V.1929, 30.I.1938 (2) (coll. Bierig: FMNH). **Jamaica:** 1 ex., St. Ann: Discovery Bay, 3.-6.IX.1974, leg. Peck (CNC). **Dominica:** 9 ex., Cabarete, 21.-30.VIII.1998, leg. Peschke (ZIF). **Puerto Rico:** 2 ex., without exact location, ex coll. Klima (coll. Scheerpeltz, NMW). **Panamá:** 9 ex., Panamá: Pueblo Nuevo (coll. Bierig: FMNH). 1 ex., Juan Diaz (coll. Bierig: FMNH). 3 ex., Chiriqui: David (coll. Bierig: FMNH). 2 ex., Chiriqui: Puerto Armuelles (coll. Bierig: FMNH). **Venezuela:** 9 ex., Carácas, leg. Marcuzzi (coll. Scheerpeltz: NMW). **Colombia:** 4 ex., Cauca: Rio Cauca Valley, leg. Thieme (coll. Kraatz: DEI). 1 ex., Magdalena: Pozo Colorado W Sta. Marta, 25.-30.IV.1968, leg. Malkin (FMNH). 1 ex., Magdalena: Valledupar, 4.-7.VI.1968, leg. Malkin (FMNH). 2 ex., La Guajira: Uribia, 11.-14.XII.1971, leg. Malkin (FMNH). 1 ex., ibid., 20.VIII.-3.IX.1969, leg. Malkin (FMNH). **Brasil:** 1 ex., Sta Catharina: Nova Teutonia, 300-500 m, 195 ..., leg. Plaumann (MNHUB). 1 ex., ibid., 193 ..., leg. Plaumann

(coll. Bernhauer: FMNH). 3 ex., ibid., IV.1941, 1944, leg. Plaumann (coll. Bierig: FMNH). 2 ex., Goias: Itumbiara, I.1995, leg. Machiori (IBC/ZIF). 3 ex., Mato Grosso: Barra do Tapirape, 20.-30.XI.1960, leg. Malkin (FMNH). 6 ex., ibid., 15.VII.-15.VIII.1962, leg. Malkin (FMNH). 1 ex., ibid., 25.XII.1962, leg. Malkin (FMNH). 1 ex., ibid., 1.-2.II.1964, leg. Malkin (FMNH). 2 ex., São Paulo: Jaro Mraz (coll. Bernhauer: FMNH). 1 ex., São Paulo: Sando, 29.VI.1914 (coll. Bierig: FMNH). 1 ex., Natal: Cearu, 27.VII.1944, leg. Wenzel (FMNH). 2 ex., Natal, leg. Mann (Stanford expedition) (coll. Bernhauer: FMNH). 1 ex., Rio de Janeiro, XII.1839, leg. Sahlberg (coll. Bernhauer: FMNH). 1 ex., Rondonia: Jipirana, leg. Hering (coll. Bernhauer: FMNH). **Bolivia:** 4 ex., Cochabamba, 2600-3000 m, 10.III.1949, 15.I.1950 and, 5.X.1957, leg. Zischka (coll. Scheerpeltz: NMW; ZSM). 7 ex., Sta. Cruz: San Antonia nr. Charagua, 1.-6.IX.1960, leg. Malkin (FMNH). **Paraguay:** 1 ex., Paraguari: Sapucay, 5.XI.1991, leg. Drechsel (SEM). 3 ex., Cordilliera: Altos, 28.I. and 25.V.1991, leg. Drechsel (SEM). 3 ex., Misiones: Ayoias, 22.VIII.1991, leg. Drechsel (SEM, ZIF). 81 ex., Guaira: Colonia Independencia, 30.IV.1991, leg. Drechsel (SEM, ZIF). 7 ex., Guaira: Villa Rica, VII.1922, leg. Schade (coll. Scheerpeltz: NMW). 11 ex., without exact locality, leg. Fiebrig (MNHUB). **Argentina:** 1 ex., Entre Rios: Cerrito, 5.IX.1910 (coll. Bernhauer: FMNH). 3 ex., Córdoba, leg. Bruch (coll. Scheerpeltz: NMW).

Synonymy: The lectotype of *A. notula* belongs to the species which was correctly redescribed by KLIMASZEWSKI (1984) and which has been treated as *A. notula* since then. A further *A. notula* specimen (♂) that has the same collection data as the lectotype is present in the MNHUB; it was not labeled as paralectotype by Klimaszewski.

A. duplicata was synonymized with *A. notula* by KLIMASZEWSKI (1984); see also KLIMASZEWSKI et al. (1987). The holotype belongs to *A. notula*. In the literature, LYNCH ARRIBALZAGA (1884) is occasionally stated to be the author of *A. duplicata*. However, this author referred his description of this taxon to *A. duplicata* ERICHSON, 1839, which was synonymized with *A. bimaculata* GRAVENHORST, 1802 by SHARP (1883). FAUVEL (1891a, b) adopted this synonymy, but he considered *A. duplicata* LYNCH ARRIBALZAGA (1884) a synonym of *A. notula*. Since then, the name *A. duplicata* has been used in two different meanings: on the one hand as *A. duplicata* ERICHSON, 1839, which has been synonymized with *A. bimaculata*, and on the other as *A. duplicata* LYNCH ARRIBALZAGA, 1884, which was considered a synonym of *A. notula* (e.g. FAUVEL 1901; FENYES 1920, BERNHAUER & SCHEERPELTZ 1926; BLACKWELDER 1943, 1944). Finally, KLIMASZEWSKI (1984) found that the type of Erichson's *A. duplicata* belongs to *A. notula*. In the end, there is only one *A. duplicata*, the author of which is ERICHSON, 1839, and LYNCH ARRIBALZAGA (1884) gave just a redescription of this taxon.

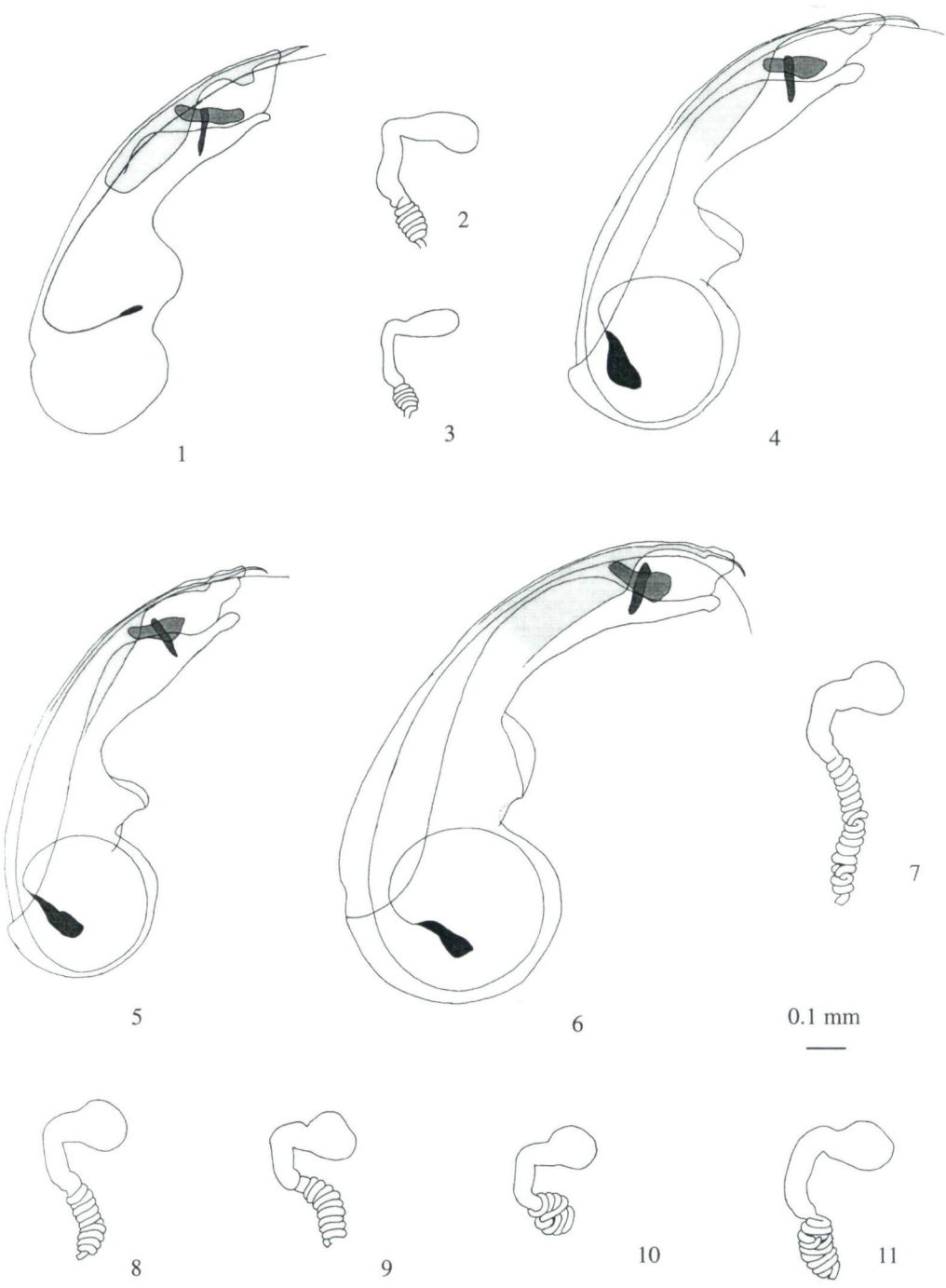
B. nanella was synonymized with *A. notula* by KLIMASZEWSKI (1984). The holotype is a small male which belongs to *A. notula*.

B. nitidicollis was synonymized with *A. notula* by KLIMASZEWSKI (1984). The lectotype is a large female of *A. notula*. Preparations of the genitalia of the paralectotypes were not made: they belong most probably to the true *A. notula*, too, since *A. signaticollis* apparently does not occur in North and Central America.

A. pernix was synonymized with *A. notula* by KLIMASZEWSKI (1985). This name was proposed as a replacement name for *A. nitidicollis* CASEY, 1906 nec SOLIER, 1849. Thus, it is a synonym of *A. notula*.

Redescription: Since a comprehensive redescription of this species has already been given by KLIMASZEWSKI (1984), I refrain from providing a further redescription of external characters. Instead, I provide a description of the genitalia in order to emphasize the structures that are of importance for distinguishing *A. notula* from *A. signaticollis*. Additionally, I give some morphometric data which have not been published yet.

Proportions: WHP: 0.65 (0.57 - 0.76; N = 82); WPE: 0.91 (0.84 - 0.97; N = 82); PLW: 0.77 (0.68 - 0.83; N = 82); LPE: 1.64 (1.26 - 1.96; N = 82); 8AWL: 2.13 (1.57 - 3.00; N = 78).



Figs. 1 - 11: 1) *A. notula*, aedeagal median lobe; 2 - 3) *A. notula*, spermatheca; 4 - 6) *A. signaticollis*, aedeagal median lobe; 7 - 11) *A. signaticollis*, spermatheca.

Body size: L: 4.17 (2.23 - 6.68; N = 77); LWA: 1.60 (1.03 - 2.31; N = 76).

Aedeagus (Fig. 1): venter of median lobe at most weakly arched, straight to distinctly bisinuate, its tip usually shortly reflexed ventrally. Bulbus rather elongate. Sclerites present: X, Y, Z. Sclerite X very thin, nearly stick-like; sclerite Z large, with a long produced, straight tip which reaches beyond the tip of median lobe, rarely the tip is slightly curved. There is a distinct, pointed or blunt process at the underside of the tip. Very seldom this process is indistinct. Sclerite Z large, elongately subrectangular. Flagellum basally reflexed in the bulbus.

Spermatheca (Figs. 2 - 3): Capsule very slender, elongately oval or subconical, sometimes slightly bisinuately curved. Chamber slender, distinctly reflexed near the capsule. In some cases, the base of the capsule is slightly produced like a spur above the base of duct. Duct small, mostly fusiform or subfusiform, infrequently cylindrical, coils thin. Number of coils: 5 (3-7; N = 48).

Distribution: *A. notula* is widely distributed throughout South, Central and southern North America. It probably occurs in large parts of South and Central America (including the Caribbean Islands), but it is not known whether it is also present in the southermost parts of South America. The northermost records are from Kansas, California, Utah, and Pennsylvania (the latter records by KLIMASZEWSKI 1984).

Bionomics (partially added after KLIMASZEWSKI 1984): *A. notula* has been found mainly on dung of herbivore mammals (e.g. cattle, horse, donkey), but also occasionally on human and dog faeces, on carrion (also on dead fish) and in lake-shore debris. Some specimens were collected at light. *Aleochara notula* occurs from sea level up to altitudes of at least 2600 m. Host records of *A. notula*: *Sepsis neocynipsea*, *Adia cinerella*, *Brontaea cilifera*, *Musca domestica*, *Neomyia cornicina*, *Ravinia derelicta*, and *Tricharaea* sp. (MAUS et al. 1998).

Remarks: All previously published records of *A. notula* from South America (at least from the southern and middle part of the continent) are doubtful and have to be re-examined. The host records of *A. notula* published in MAUS et al. (1998) refer to the true *A. notula*: the records were based on North American specimens where *A. signaticollis* does not occur, or the voucher specimens checked by the author.

Aleochara (*Coprochara*) *signaticollis* FAIRMAIRE & GERMAIN, 1861

Aleochara signaticollis FAIRMAIRE & GERMAIN, 1861: 413

TYPE MATERIAL: Lectotype (♂):"Aleochara / signati- /collis n sp. " "245" (IRSNB). Paralectotypes: 3 ♀♀, same data as holotype (IRSNB). 2 ♀♀: "Chili" "Aleochara / signaticollis / Frm. " (IRSNB). 1 ♂ without labels (IRSNB). The labels on which the type specimens were originally mounted, are attached to respective pins.

ADDITIONAL MATERIAL EXAMINED:

Brasil: 1 ex., Bahia: Prado (DEI). 1 ex., Rio de Janeiro: Porto Alegre, leg. Hensel (MNHUB). **Perú:** 1 ex., Lima: Lachay nr. Chancay, 250 m, VIII.1951, leg. Weyrauch (coll. Scheerpeltz: NMW). 1 ex., Cuzco: Sicuani (coll. Bernhauer: FMNH). 1 ex., Cuzco: Pata- Pata, 3800 – 4200 m, 30.I.1949, leg. Kuschel (coll. Scheerpeltz: NMW). 2 ex., Ayaucho: Colta, 9.VII.1905, leg. Ohaus (MNHUB). 1 ex., Puno: Juliaca, 3800 m (MNHUB). **Bolivia:** 5 ex., La Paz: Lake Titicaca: Huatajata, 4000 m, 6. – 17.I.1954, leg. Forster (ZSM). 1 ex., Cochabamba, 2600 m, leg. Zischka (coll. Scheerpeltz: NMW). 1 ex., Cochabamba: Carrasco: Serranía de Siberia, Chua Khocha, 2300 m, leg. Ledezma (FMNH). **Uruguay:** 1 ex., Montevideo, don. Bernhauer (coll. Scheerpeltz: NMW). 1 ex., Montevideo: Cerro, 1.X.1933, leg. Fernandez (coll. Bernhauer: FMNH). 3 ex., Montevideo: Armiguelete, leg. Tremoleras, ex coll. Fernandez (coll. Bernhauer: FMNH). 1 ex., without exact location (coll. Bernhauer: FMNH). **Argentina:** 3 ex., Buenos Aires: Bahia Blanca, leg. Weiske (coll. Scheerpeltz: NMW, and coll. Bernhauer: FMNH, and coll. Frey: NHMB). 1 ex., Buenos Aires: La Plata, VII.1938, leg. Roses Costa (coll.

Bierig: FMNH). 11 ex., La Rioja: Chañar[1], leg. Jensen (coll. Bernhauer: FMNH). 1 ex., Entre Rios: Cerrito, 5.IX.1910 (coll. Bernhauer: FMNH). 1 ex., Rio Negro: Rio Colorado, 189..., leg. Bruch (coll. Bernhauer: FMNH). 1 ex., Córdoba: Arguella, XI.1957 (coll. Scheerpeltz: NMW). 2 ex., Córdoba: Tanti Viejo, don. Bruch (coll. Scheerpeltz: NMW). 2 ex., ibid., 189..., leg. Bruch (coll. Bernhauer: FMNH). 2 ex., Córdoba, 189..., leg. Bruch (coll. Bernhauer: FMNH). 3 ex., ibid., 189..., leg. Spegazzini, ex coll. Bruch (coll. Bernhauer: FMNH). 7 ex., Salta (MNHUB). 1 ex., Salta, 1200 m, leg. Steinbach (MNHUB). **Chile:** 3 ex., Concepción: Coelemu, 5.II.1976, leg. Moreno (CNC). 1 ex., Concepción: Nonguen, 25.IX.1976, leg. Cekalovic (CNC). 3 ex., Coquimbo: Alcohuaz, 1823 m, 24.X.1994, leg. Leschen & Carlton (SEM). 3 ex., Santiago: El Canelo, 13.III.1941, leg. Guzman (FMNH). 1 ex., Santiago: El Canelo, XI.1978, leg. Pena (FMNH). 2 ex., Santiago, leg. Puelma (MNHUB). 1 ex., without exact location, ex coll. Fairmaire (coll. Kraatz: DEI). 1 ex., without exact location, leg. Reed, ex coll. Fry (coll. Bernhauer: FMNH). 3 ex., without exact location, ex coll. Sharp (coll. Bernhauer: FMNH). 1 ex., without exact location, ex coll. Arrow (coll. Bernhauer: FMNH). 1 ex., without exact location, leg. Fairmaire, ex coll. Kraatz (coll. Bernhauer: FMNH).

Lectotype designation: Since FAIRMAIRE & GERMAIN (1861) did not explicitly state on how many specimens the description was based, it is not impossible that there are further syntypes of *A. signaticollis* existing in some collections. I here designate a lectotype from the syntypes which are housed in the IRSNB.

Remarks: In some publications, the years 1858 or 1860 are given as the year of publication of the original description (e.g. FENYES 1920; KLIMASZEWSKI 1984). However, as there was clearly stated in the description, it was in fact published in 1861. According to the original description, the locus typicus is Santiago de Chile.

Redescription: Head orbicular, approximately square with rounded-off corners, or slightly oblong, black to dark reddish brown. Punctures coarse to moderately fine, dense to scarce, rarely very scarce, with unpunctured midline, and sometimes with two additional unpunctured lines extending from anterior edge of eyes diagonally to middle of head. Pubescence directed forward laterally, anteriorly in frontal regions, and medially (or obliquely inwards) in central regions. Micropunctures mostly distinct to very distinct, sometimes indistinct (in very small specimens sometimes hardly visible), moderately dense to very dense.

Pronotum large, suborbicular, transversely oval or broadly oval, subconical, or trapezoid in outline, with a straight anterior edge, infrequently subrectangular, relatively strongly convex transversely, sometimes also slightly convex longitudinally. Posterior angles mostly strongly rounded. Color black to dark brown, margins sometimes slightly lighter; pronotal punctures, except in dorsal rows, fine to moderately coarse, moderately dense to very scarce, sometimes scarcer in the anterior inner regions, frequently consisting of punctures of different sizes. A single larger puncture is located on either side of pronotum, in the middle of the areas left and right of dorsal rows. Punctures of dorsal rows fine to moderately fine, more or less scarce, less frequently dense. Rows not or weakly impressed, but frequently slightly enlarged and impressed at their base, where the punctures are often somewhat indistinct and blurred. In the dorsal rows, there are frequently two conspicuous, larger punctures on each side which sometimes contain one or a few smaller punctures; those larger punctures are mostly situated after the first and the second third of each dorsal row. They are especially distinct in small specimens. In the anterior part of the pronotum, the rows are doubled, and posteriorly they are tripled or occasionally quadrupled. Pronotal pubescence mostly fine and scarce, directed obliquely backwards. Micropunctures fine to very fine, but dense to very dense, infrequently moderately scarce, rarely scarce, and in very small specimens sometimes hardly visible.

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[1] On the labels, this place is spelled "Bras. Channar. Reg.". However, there is apparently no locality of this name in Brasil; BERNHAUER (1908) spells it "Chaunar- Region" in Argentina, but I could not trace this place, either. Most probably, this record refers to Chañar in La Rioja, Argentina.

Elytra mostly brown, dark brown or blackish brown, base and sometimes sides black, apical or inner apical parts frequently lighter to a very variable extent, yellow, orange or reddish brown, border between darker and lighter part not well-defined and blurred. Less frequently there is a mostly indistinct, blurred terminal spot on each elytron which covers the inner 3/5 to ½ and the apical ¾ to ½ of the elytron, leaving the suture dark. Sometimes there is an indistinct terminal spot in a relatively light area, and elytra are gradually darkened towards base and sides. Rarely, elytra are uniformly brown with indistinctly darkened base and sides or they are nearly black with indistinctly lighter apex. Elytral punctures moderately fine to moderately coarse, dense to moderately dense, rarely moderately scarce, impressed slightly from outside-behind but nearly circular, rarely more distinctly impressed from outside-behind and crescent-shaped. Punctures frequently more or less distinctly rasp-like, rarely slightly wrinkled obliquely. Elytral pubescence directed posteriad at the sides of elytra, in the inner basal parts obliquely backwards at an angle of about 20 to 60°, in the apical parts at an angle of 40 to 90°. Microsculpture very fine and indistinct or absent.

Abdomen slightly to very slightly depressed, distinctly tapered apically, black to blackish brown, rarely dark brown, or apical parts of tergites slightly lighter. Basal impression on tergite III deep to very shallow, on tergite IV deep to moderately deep, rarely shallow, on tergite V deep to very shallow. Punctures moderately coarse to fine, very dense to moderately scarce. Punctures on basal tergites (or at least in the basal impressions) circular or rarely subcircular, on the other tergites mostly more or less oblong, on tergite VIII circular to subcircular. On tergite VIII (or on its apical part), punctures are frequently finer, on the middle of the apical part of tergite VI and VII sparser, sometimes also on the middle of the apical part of tergite V. In very small specimens, abdominal punctures are sometimes completely more or less circular and scarce. On tergite VIII, punctures are sometimes slightly rasp-like. Occasionally, there is an indistinct microsculpture on the apical tergites. Male sternum VIII rounded apically.

Antennae moderately long to moderately short, slender to moderately slender, brown or reddish brown to blackish brown, frequently lighter basally. Legs light to dark brown, tarsi yellowish brown.

Proportions: WHP: 0.64 (0.59 - 0.71; N = 66); WPE: 0.86 (0.80 - 0.91; N = 66); PLW: 0.78 (0.65 - 0.84; N = 67); LPE: 1.49 (1.21 - 1.82; N = 67); 8AWL: 2.11 (1.44 - 2.80; N = 64).

Body size: L: 5.34 (2.84 - 6.90; N = 67); LWA: 2.02 (1.26 - 2.55; N = 67).

Aedeagus (Figs. 4 - 6): median lobe mostly slender, its venter straight to slightly (rarely distinctly) bisinuate, sometimes slightly arched. Tip more or less straight, frequently slightly thickened and enlarged ventrally, rarely very slightly reflexed ventrally. Bulbus approximately circular or slightly oblong. The angle between the ventral projection of the aedeagal median lobe at the base of the bulbus that bears the external carina, and the bulbus is about 90° or larger (very rarely slightly less than 90°). Sclerites present: X, Y, Z. Sclerite Z with a long produced, curved tip which reaches beyond the tip of median lobe, rarely there is an indistinct, blunt process at the underside of the tip, or the tip is sharply bent. Extent and structure of the basal part of sclerite Z could not be clearly recognized. Flagellum one time coiled in the bulbus.

Spermatheca (Figs. 7 - 11): capsule orbicular or suborbicular, chamber slender to moderately slender, reflexed next to the capsule. Duct cylindrical, subcylindrical, or subfusiform, sometimes with a curved axis, rarely partially somewhat irregularly coiled. Coils moderately thin. Number of coils: 10 (7-19; N = 30).

Differential diagnosis: There are nearly no ectoskeletal characters to distinguish *A. signaticollis* from *A. notula*. In the former species, the micropunctures on head and pronotum are on an average slightly more distinct and denser than in the latter. The elytra are frequently slightly

more densely and more distinctly rasp-like punctate in *A. signaticollis* than in *A. notula*. And, the elytral terminal spots are often more clearly defined in the latter species than in the former one, which has mostly rather blurred terminal spots or just inner apical parts of elytra lightened. However, these ectoskeletal characters are hardly suitable to identify individual specimens in most cases. In contrast, both species can easily be distinguished by the morphology of aedeagus and spermatheca. In *A. signaticollis*, the ventral projection of the aedeagal median lobe at the base of the bulbus, that bears the external carina, is more produced than in *A. notula*; the bulbus is larger in *A. signaticollis* than in *A. notula*. The tip of median lobe is frequently more distinctly reflexed ventrally in the latter species than in the former. In *A. notula*, the flagellum is only reflexed at its base in the bulbus, in *A. signaticollis*, it is one time coiled. The produced apical tip of sclerite Z is more or less curved in *A. signaticollis*, but in *A. notula* it is mostly straight, and bears a ventral projection. In *A. notula*, the spermathecal capsule is slenderly oblong or subconical, in *A. signaticollis* it is spherical or subspherical. The spermathecal duct is fusiform (seldom cylindrical) and rather short in *A. notula*, with usually less than eight coils, the individual coils are more tiny; in *A. signaticollis*, the duct is mostly cylindrical (sometimes cylindrical and reflexed, or irregularly coiled) with mostly more than eight coils, the individual coils are coarser. With regard to morphometric data, there are significant differences (Mann-Whitney test) between *A. signaticollis* and *A. notula* in WPE ($P < 0.0001$), PLW ($P = 0.0072$), LPE ($P < 0.0001$), L ($P < 0.0001$), and LWA ($P < 0.0001$). These differences, however, are only rarely suitable for distinguishing individual specimens, since the ranges of values more or less broadly overlap.

Some *A. signaticollis* specimens are relatively similar to *A. peschkeana* MAUS, 1999. They can be distinguished from this species by shorter and sparser elytral pubescence, frequently lighter legs, and on an average shorter elytra and broader head (in relation to pronotum); furthermore, the flagellum has one coil in the male aedeagal median lobe in *A. signaticollis*, and two coils in *A. peschkeana*, and the angle between the ventral projection of the aedeagal median lobe at the base of the bulbus that bears the external carina and the bulbus is nearly always distinctly greater than 90° in *A. signaticollis*; it is less than 90° in *A. peschkeana*. The bulbus of the median lobe is usually larger in *A. peschkeana* than in *A. signaticollis*.

Aleochara signaticollis can be easily distinguished from all other South and Central American *Coprochara* species: *A. bimaculata* has elytra with rasp-like, granulose punctation, a more densely punctured and pubescent pronotum with more densely punctured and larger dorsal rows, a more parallel abdomen, and a male aedeagal median lobe with a larger bulbus. In *A. trachynoptera* MAUS, 2000, the elytral punctation is also more rasp-like; additionally, the aedeagal flagellum is not coiled in this species, and the spermathecal duct has fewer coils. In *A. pycnostichia* MAUS, 2000 the punctures of the pronotal dorsal rows are much coarser and the abdominal punctures much sparser than in *A. signaticollis*, furthermore the aedeagal flagellum is twice coiled. *Aleochara solieri* BERNHAUER & SCHEERPELTZ, 1926, *A. mutare* BLACKWELDER, 1944, and *A. sulcicollis* MANNERHEIM, 1843 have distinctly to strongly impressed pronotal dorsal rows, in *A. densissima* BERNHAUER, 1906 the pronotal pubescence is denser, and the elytral punctation is more distinctly rasp-like, *A. composita* CASEY, 1906 is smaller, has dark elytra and a spermatheca with a more fusiform duct, and *A. verna* SAY, 1836 is mostly smaller, has a usually less convex pronotum and differently shaped spermatheca and aedeagus.

Distribution: In contrast to *A. notula*, *A. signaticollis* seems to be restricted to the South American continent; specimens from North and Central America were not found. Records are known from Peru, Bolivia, Uruguay, Argentina, and Chile. Most probably, *A. signaticollis* inhabits the complete southern part of South America. It is not clear yet where the northern and northeastern borders of the distribution area are located.

Bionomics: *A. signaticollis* probably is a dung-dwelling species which occasionally can also be found on carrion and other decaying organic substances, like most other *Coprochara* species. One of the investigated specimens was collected from cattle dung, a further one under a log in a cloud forest at an altitude of 2300 m. Apparently, *A. signaticollis* lives at all altitudes from about sea level to over 4000 m. The larvae are presumably solitary ectoparasitoids of cyclorrhaphous Diptera.

Phylogenetic relationships: As mentioned above, *A. signaticollis* is extremely similar to *A. notula* externally. However, the genitalia of *A. signaticollis* distinctly resemble those of *A. bimaculata* in both sexes. A coiled flagellum has to be considered an autapomorphy of the *A. bimaculata* group (as defined by MAUS & ASHE 1998). Therefore it is more likely that *A. signaticollis* is not the sister species of *A. notula*, since this assumption of a sister-group relationship would require an analogous evolution of a coiled flagellum twice among a few closely related species. The explanation that a coiled flagellum has only once developed in *Coprochara* is more likely, although the scenario of an independent evolution of a coiled flagellum twice in this group cannot definitely be excluded at the present state of knowledge. An insertion of *A. signaticollis* into the phylogenetic tree proposed by MAUS & ASHE (1998) would lead to the following relationships among the species of the *notula* and *bimaculata* groups: (*trachynoptera* + *notula* + (*signaticollis* + *ashei* + ((*bimaculata* + *peschkeana*) + (*pycnostichia* + (*mutare* + *solieri*))))). A synapomorphy of the latter five species is an aedeagal flagellum which is more strongly coiled in than *A. signaticollis*. The ectoskeletal similarity of *A. notula* and *A. signaticollis* is interpreted as based on homoplasies.

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References

BERNHAUER, M. 1908: Beitrag zur Staphylinidenfauna von Südamerika. - Archiv für Naturgeschichte 74 (1): 282-372.

BERNHAUER, M. & SCHEERPELTZ, O. 1926: Staphylinidae VI. In W. JUNK & S. SCHENKLING (eds.): Coleopterorum Catalogus pars 82. - Berlin: Junk, pp. 499-988.

BLACKWELDER, R.E. 1943: Monograph of the West Indian beetles of the family Staphylinidae. - Smithsonian Institution U. S. National Museum Bulletin 182: pp. 1-623.

BLACKWELDER, R.E. 1944: Checklist of the coleopterous insects of Mexico, Central America, the West Indies and South America. Part 1. - Smithsonian Institution U. S. National Museum Bulletin 185: 188 pp.

CASEY, Th.L. 1906: Observations on the Staphylinid groups Aleocharinae and Xantholininae, chiefly in America. - Transactions of the Academy of Sciences St. Louis 16: 125-434.

ERICHSON, W.F. 1839: Genera et species staphylinidorum insectorum coleopterorum familiae I. - Berlin: F.H. Morin, pp. 1-400.

FAIRMAIRE, M.L. & GERMAIN, Ph. 1861: Révision des coléoptères du Chili (Suite) (1). - Annales de la Société entomologique de France 4 (1): 405-456.

FAUVEL, A. 1891a: Voyage de M. E. Simon au Venezuela (Decembre 1887-Avril 1888). 11e memorie (1): Staphylinides. - Revue d'Entomologie 10: 86-127.

FAUVEL, A. 1891b: Los estafilinos de Buenos Aires. Notes sur l'ouvrage de M. F. Lynch Arribalzaga. - Revue d'Entomologie 10: 230-234.

FAUVEL, A. 1901: Voyage de M. le Dr. Ed. Bugnion au Venezuela, en Colombie et aux Antilles. - Revue d' Entomologie 20: 69-91.

FENYES, A. 1920: Coleoptera, Staphylinidae, Aleocharini. In P. WYTSMAN (ed.): Genera insectorum fasc. 173B. - Bruxelles: Verteneuil & Desmet, pp. 111-414.

KLIMASZEWSKI, J. 1984: A revision of the genus *Aleochara* Gravenhorst of America north of Mexico (Coleoptera: Staphylinidae, Aleocharinae). - Memoirs of the Entomological Society of Canada 129: pp. 1-211.

KLIMASZEWSKI, J, 1985: Nomenclatorical changes in the genus *Aleochara* Gravenhorst (Coleoptera: Staphylinidae: Aleocharinae). - The Coleopterists Bulletin 39 (4): 376.

KLIMASZEWSKI, J., GENIER, F. & UHLIG, M. 1987: Review of Erichson's types of *Aleochara* from Mexico, West Indies and South America. - Florida Entomologist 70 (2): 249-259.

KLIMASZEWSKI, J. & JANSEN, R.E. 1994: Systematics, biology and distribution of *Aleochara* Gravenhorst from Southern Africa. Part 3: subgenus *Coprochara* Mulsant and Rey (Coleoptera: Staphylinidae). - Annals of the Transvaal Museum - 36 (10): 147-170.

KLIMASZEWSKI, J. & MAUS, Ch. 1999: Review of Bernhauer's types of *Aleochara* from South America (Coleoptera: Staphylinidae: Aleocharinae). - Zoological Studies 38 (2): 207-221.

LYNCH ARRIBALZAGA, F. 1884: Estafilinidos de Buenos Aires. - Boletim de la Academia Nacional de Ciencias Córdoba 7: 4-384.

LOHSE, G.A. 1986: *Aleochara*-Studien II: Die rotgefleckten Arten der Untergattung *Coprochara* Mulsant & Rey. - Verhandlungen des Vereins für naturwissenschaftliche Heimatforschung, Hamburg 39: 95-98.

MAUS, Ch. 1998: Taxonomical contributions to the subgenus *Coprochara* Mulsant & Rey, 1874 of the genus *Aleochara* Gravenhorst, 1802 (Coleoptera: Staphylinidae). - Koleopterologische Rundschau 68: 75-94.

MAUS, Ch. 1999: Four new species of the genus *Aleochara* Gravenhorst, 1802, subgenus *Coprochara* Mulsant & Rey, 1874 (Coleoptera: Staphylinidae). - Beiträge zur Entomologie 49 (2): 357-367.

MAUS, Ch. 2000: Fourth taxonomical contribution to the subgenus *Coprochara* Mulsant & Rey, 1874 of the genus *Aleochara* Gravenhorst, 1802. Description of four new species (Coleoptera: Staphylinidae). - Koleopterologische Rundschau 70: 69-78.

MAUS, Ch. & ASHE, J.S. 1998: *Aleochara* (*Coprochara*). In D.R. MADDISON & W.P. MADDISON (eds.): The Tree of Life: A distributed internet project containing information about phylogeny and biodiversity. - Internet address: http://ag.arizona.edu/tree/phylogeny.html.

MAUS, Ch., MITTMANN, B. & PESCHKE, K. 1998: Host records of parasitoid *Aleochara* Gravenhorst species (Coleoptera: Staphylinidae) attacking puparia of cyclorrhapheous Diptera. - Deutsche Entomologische Zeitschrift 45 (2): 231-254.

PESCHKE, K. & FULDNER, D. 1977: Übersicht und neue Untersuchungen zur Lebensweise der parasitoiden Aleocharinae (Coleoptera: Staphylinidae). - Zoologische Jahrbücher (Systematik) 104: 242-262.

SHARP, D. 1883: Biologia Centrali-Americana. Insecta: Coleoptera, vol. I, part 2. - London: Taylor & Francis, pp. 145-312.

Christian MAUS
Institut für Biologie I (Zoologie), Hauptstr. 1, D – 79104 Freiburg, Germany