In my thesis, I studied the external structures associated with the metathoracic scent glands in Heteroptera, particularly in the superfamily Pentatomoidea. I focused on i) a review of terminology used for description of macrosculpture and microsculpture of these structures; ii) their morphology and structural diversity in particular families of Pentatomoidea; and iii) an attempt to homologize and polarize these structures and test their potential use for a phylogenetic hypothesis in Pentatomoidea.

The following main terms are selected for description of the macrosculpture (thoracic scent efferent system (internal and external), valvular apparatus, internal orifice, vestibule, vestibular scar, ostiole, periostiolar depression, peritreme, auricle, spout, groove, ruga, disc, peritremal lobes, evaporatorium, and gyrification) and microsculpture (mycoid microsculpture, mushroom body, cap, stem, bridge, alveole, trabeculae, and peritremal microsculpture). These terms are defined, and an extensive list of synonyms for each of them is compiled.

The structures of the external scent efferent system are described for all families of the Pentatomoidea. The following conditions of the external scent efferent system are considered plesiomorphic: vestibular scar developed; ostiole situated between mesoacetabulum and metacetabulum, large, round or oval, opening laterally; periostiolar depression missing; peritreme in form of a spout with peritremal surface perpendicular or oblique to surface of metapleuron; evaporatorium rather large, developed on both metapleuron and mesopleuron; gyrification of evaporatorium developed but shallow. A possible anagenesis of the particular shapes of peritreme is suggested. Only few synapomorphies useful for definition of family-group taxa within Pentatomoidea are found and corroborated by a cladistic analysis (i.e., development of peritremal lobes in Tessaratomidae, extension of evaporatorium on prothorax in Plataspidae). Most of other apomorphic states are recognized as homoplasious and evolved several times independently in various groups. Characters of external scent efferent system are, however, generally valuable for definitions of genus- and species-group taxa and can be potentially used for reconstruction of their phylogeny.

The following manuscript [1] and published papers [2–4] are included in the thesis:

THE EXTERNAL STRUCTURES ASSOCIATED WITH THE METAPLEURAL SCENT GLANDS IN THE FAMILY TESSARATOMIDAE (HEMIPTERA: HETEROPTERA: PENTATOMOIDEA) [1]

The cuticular structures associated with the opening of the adult metathoracic scent glands were studied in the family Tessaratomidae. The terminology used for these structures in the Tessaratomidae and Pentatomoidea is briefly reviewed and most suitable terms are selected (i.e., metathoracic scent apparatus, internal and external scent efferent system, internal orifice, vestibule, ostiole, ostiolar groove, peritreme, auricle, spout, groove, ruga, disc, peritremal lobes, evaporatorium, mycoid surface, mushroom body, bridge, alveole, trabeculae, peritremal surface). We examined and illustrated external scent efferent system of representatives of 40 species from 33 genera belonging to all three subfamilies of Tessaratomidae *sensu lato*, i.e. Tessaratominae, Natalicolinae, and Oncomerinae. Three basic types were recognized: i) Oncomerinae – ostiole slightly removed laterally from the position between coxal acetabula, oval, ostiolar groove not developed or very short, peritreme in form of spout attached anterolaterally to the ostiole; ii) Tessaratomidae *sensu stricto* (= Tessaratominae + Natalicolinae) – ostiole situated between acetabula, strongly incised mesad, thus vestibule

distally opened in two planes (ventrally and laterally) as ostiolar groove, peritreme in form of anterior and posterior peritremal lobe surrounding the ostiolar groove; and iii) Platytatina (*Platytatus ambiguus* Bergroth, 1892) – ostiole shifted near to lateral metapleural margin, ostiolar groove reduced, situated between two flat, reniform processes (median and lateral lobe). The anagenesis of these structures is suggested, the type i) of Oncomerinae is regarded as plesiomorphic (shared with Urostylididae, Dinidoridae, etc.), the type iii) of Platytatina is homologized with type ii) of Tessaratominae *sensu stricto*, the type ii) is unique within Pentatomoidea and considered an autapomorphy. The suitability of the characters of the external scent efferent system for phylogenetic hypothesis of relationships within Pentatomoidea is tested using by set of cladistic analyses. We found some apomorphies helping to define Tessaratomidae and Plataspidae, however, most of the characters seem to be homoplasious at family level. The results of cladistic analyses further support the monophyly of Dinidoridae + Tessaratomidae *sensu lato* and of Tessaratomidae *sensu stricto*, while the relationships of Oncomerinae and Tessaratomidae *sensu stricto* as well as relationships among family-group taxa within Tessaratomidae *sensu stricto* need further studies.

REVISION OF *MAHEA* DISTANT, 1909, WITH A REVIEW OF THE ACANTHOSOMATIDAE (INSECTA: HETEROPTERA) OF MADAGASCAR AND SEYCHELLES [2]

The genus Mahea Distant, 1909 (Heteroptera: Pentatomoidea: Acanthosomatidae: Acanthosomatinae) is revised. *Muschalea* Cachan, 1952, is corroborated as a junior synonym of *Mahea*. Five species are recognized: *Mahea sexualis* Distant, 1909, (Seychelles) and *M. andriai* (Cachan, 1952) (Madagascar) are redescribed based on examination of the type specimens; three additional species – *Mahea distanti* sp. nov., *M. durrelli* sp. nov., and *M. parvula* sp. nov. from Madagascar – are described. The lectotypes of *M. sexualis* and *Noualhieridia rufa* Cachan, 1952, are designated. A key to the known acanthosomatid species of Madagascar and Seychelles is given. Possible phylogenetic relationships among the genera *Mahea*, *Catadipson* Breddin, 1903, *Ibocoris* Roche, 1948, and *Uhlunga* Distant, 1892, are briefly discussed.

A REVISION OF THE ENDEMIC MADAGASCAN GENUS *TRIPLATYX* (HEMIPTERA: HETEROPTERA: PENTATOMIDAE) [3]

The endemic Madagascan genus *Triplatyx* Horváth, 1904 (Pentatomoidea: Pentatomidae: Pentatominae: Triplatygini) is redescribed. Five species are recognized, two of them being new: *T. bilobatus* Cachan, 1952, *T. dubius* Jensen-Haarup, 1931, *T. kerzhneri* sp. nov., *T. quadraticeps* Horváth, 1904, and *T. stysi* sp. nov. All species are (re)described, including the so far unknown male and female genitalia and important characters are illustrated. The lectotype of *T. quadraticeps* is designated. The fi rst known larva of the genus (*T. quadraticeps*) is described and fi rst data on its bionomics are included.

A REVISION OF *TRIPANDA* AND *TENERVA* (HEMIPTERA: HETEROPTERA: PENTATOMIDAE: PENTATOMINAE) [4]

The Afrotropical genus *Tripanda* Berg, 1899 (Heteroptera: Pentatomidae: Pentatominae: Cappaeini), is diagnosed and revised based on the study of primary types. The endemic Madagascar genus *Tenerva* Cachan, 1952, syn. et stat nov., is recognized as a junior synonym of *Tripanda*, but retained as a valid subgenus due to the distinct differences in the structure of the female genitalia. *Veterna decorata* Jensen-Haarup, 1937, is redescribed and transferred to *Tripanda* (subgenus *Tenerva*). We currently recognize seven species within the genus:

Tripanda (*Tenerva*) *collaris* (Cachan, 1952) comb. nov. (Madagascar); *T.* (*Tenerva*) *decorata* (Jensen-Haarup, 1937) comb. nov. (Namibia, South Africa, Zambia, Zimbabwe; Yemen); *T.* (*Tripanda*) *dispar* Schouteden, 1964 (Democratic Republic of the Congo, Ivory Coast, Nigeria, Republic of the Congo); *T.* (*Tripanda*) *horacekorum* sp. nov. (Central African Republic, Gabon, Ghana, Ivory Coast, Nigeria, Republic of the Congo, Senegal); *T.* (*Tripanda*) *jurickorum* sp. nov. (Guinea); *T.* (*Tripanda*) *longiceps* (Villiers, 1967) (Central African Republic, Ghana, Guinea, Ivory Coast, Republic of the Congo); and *T.* (*Tripanda*) *signitenens* (Distant, 1898) (Angola, South Africa, Tanzania, Zambia). Lectotypes for *Tenerva collaris*, *Veterna decorata*, *Tripanda dispar*, and *T. signitenens* are designated. All species of the genus are keyed, important diagnostic characters are illustrated, and known information about their bionomics and ecology is summarized.