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MORPHOLOGY OF THE INNER SIDE OF THE MANDIBLE IN MICROMAMMALS (MAMMALIA: INSECTIVORA, CHIROPTERA, RODENTIA) OF ROMANIA

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Abstract. In this paper, the inner side of the mandible of 39 Romanian micromammal species (Mammalia: Insectivora, Chiroptera, Rodentia) is described and illustrated. The author proposed the name of some structures observed on the inner side of the mandible as: *fossa ramus mandibulae* (FRM), *processus angulus mandibulae* (PAM), *incisura mandibulae superior* (IMS), *incisura mandibulae inferior* (IMI), *crista ramus mandibulae* (CRM), *processus corpus mandibulae* (PCM).

Résumé. Dans ce travail la face interne de la mandibule est illustrée et décrite chez 39 espèces de micromammifères (Mammalia: Insectivora, Chiroptera, Rodentia) de Roumanie. L'auteur propose de dénommer certaines structures observées sur la face interne de la mandibule: *fossa ramus mandibulae* (FRM), *processus angulus mandibulae* (PAM), *incisura mandibulae superior* (IMS), *incisura mandibulae inferior* (IMI), *crista ramus mandibulae* (CRM), *processus corpus mandibulae*(PCM).

Key words: mandible, morphology, description, new names, micromammals, Romania.

INTRODUCTION

For the identification and classification of the mammal species the phenotypical, serological and genetic features were taken into consideration. The skulls and even the mandibles of different species were the subject of many scientists' studies.

Researchers like Miller (1912), Grassé (1955 a, b), Topál (1969) (for chiropterans) Eisenberg (1989) presented drawings of the skull and/or of the mandible from different genera and species but they did not comment their characteristics.

Others made studies of comparative anatomy or described the parts of the skull, including the mandible of different mammal species. George & Gaughran (1954) mentioned the morphological features of the outer and inner side of the mandible in *Blarina brevicauda* (Say, 1823) and *Scalopus aquaticus* (Linnaeus, 1758). Nițescu-Andreescu (1973) made a comparative study of the skull of five rodent species (Fam. Muridae) of Romania. Andreescu (1974) illustrated and compared the skull of three shrew species (Fam. Myoxidae) of Romania.

Sánchez-Villagra & Smith, 1997 presented the diversity and the evolution of the mandible angular processus (*processus angulus mandibulae*) in marsupials. Parra, Jaeger & Bocherens, 1999 described the skull of the fossil genus *Microtia* Freudenthal, 1976 from Gargano (Italy).

In a study on the morphological variation intra- and interspecifically, Renaud & Millien, 2001 compared the mandible of the species *Apodemus argenteus* (Temminck, 1844) and *Apodemus speciosus* (Temminck, 1844), from the Japanese Archipelago. Giannini, Wible & Simmons, 2006 presented the skull morphology for

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the genus *Pteropus*. Răduleț (2005, 2006 a) described the outer side of the mandible in 40 micromammal species (Mammalia: Insectivora, Chiroptera, Rodentia) of Romania and in nine bat species (Chiroptera) of Brazil, South America (Răduleț, 2006 b).

The present study refers to the characteristics of the inner side of the mandible which together with those of the outer side complete the description of the mandible and make easier the identification of the species and genera. Thus they can be distinguished from the skeleton remains from the pellets, collections or from the terrestrial substratum, tree hollows, caves, garrets, etc.

MATERIAL AND METHOD

My study bases on the material from the collections of "Grigore Antipa" National Museum of Natural History (Bucharest). For the study of the inner side of the mandible I used over 1,000 skulls of 39 species collected from different regions of Romania. I had at my disposal only one-two skulls for the species: *Rhinolophus hipposideros* (Bechstein, 1800); *Rhinolophus mehelyi* Matschie, 1901; *Vespertilio murinus* Linnaeus, 1758; *Plecotus austriacus* (Fischer, 1829); *Eptesicus serotinus* Schreber, 1774; *Pipistrellus savii* (Bonaparte, 1837); *Cricetulus migratorius* (Pallas, 1773).

The mandibles were studied using the stereomicroscope and drawn using camera lucida.

A very few scientists, and only sporadically, pointed out some structures of the inner side of the mandible in their studies.

In their comparative study of osteology and myology of the skull and cervical region in *Blarina brevicauda* (Say, 1823) and *Scalopus aquaticus* (Linnaeus, 1758), George & Gaughran (1954) described also mandible structures as: *processus condyloideus, angular process, mandibular foramen, postinternal ramal fossa* (*pterygoid fossa*), etc.

Calculating the mandibular index (after Wolff, 1976) Pucek (1981) took into consideration the mandible foramen, *angular process*. In the identification key for Vespertilionidae, and especially of the genus *Plecotus*, he also refered to *angular process*.

Also he analyzed the position of the mandible foramen (*foramen mandibulae*) which distinguishes *Microtus arvalis* (Pallas, 1778) from *Microtus agrestis* (Linnaeus, 1761) and *Mus musculus* Linnaeus, 1766 from *Sicista betulina* Pallas, 1779.

Besides *foramen mandibulae*, on the inner side of the mandible there are also other formations which, because of their position, form and size, are characteristic to the species or genus and can be take into account in their identification.

Formation from the posterior side of the mandible ramus and under *processus condyloideus* (PCON) was named: *angular process* by George & Gaughran (1954); Pucek (1981); Parra, Jaeger & Bocherens (1999); Renaud & Millien (2001); *angulus mandibulae* by Nițescu-Andreescu (1973); Andreescu (1974); *processus angulus mandibulae* by Sánchez-Villagra & Smith (1997); *angular apophysis*, but also "apophise lémurienne" by Grassé (1955 b); *apophyse angulaire* by Grassé (1967); *angular apophisis* de Murariu (2004); *processus angularis* by Murariu (1999); Giannini, Wible & Simmons (2006); Tudor & Constantinescu (2002).

Considering the scientists' hesitation in its denomination, Răduleț (2005, 2006 a, b) named it „*non nominatus processus*". But, I consider that the name used by Sánchez-Villagra & Smith (1997) – *processus angulus mandibulae*, is the most appropriate. This, because it presents what is this formation (*processus*) and where it is placed (*angulus mandibulae*).

In the species of the family Soricidae the cavity from the inner side of the mandible from *ramus mandibulae* and from the base of *processus coronoideus* was named *pterygoid fossa* by Hibbard (1943, 1944). Stirton (1930) and Macdonald (1947) named it *internal temporal fossa*, and George & Gaughran (1954), after Hibbard (1953), *posteriointernal ramal fossa*. Taking into account that it is in *ramus mandibulae* I propose the term *fossa ramus mandibulae*.

At the level of the mandible there are, in fact, two incisures. I think that it is necessary that *incisura mandibulae* to be renamed *incisura mandibulae superior*, and that between *processus condylaris* (*condyloideus*) and *processus angulus mandibulae* as *inncisura mandibulae inferior*.

In rodents, on the inner side of the mandible, between *ramus mandibulae* and *processus angulus mandibulae* there is a crest or a mane-like formation. Because the previous studies do not refer to it I recommend the name of c*rista ramus mandibulae*.

In some rodent species *corpus mandibulae* ends with a more massive formation which can contributes to its recognition by its shape and direction. I suggest to be named *processus corpus mandibulae*.

Abbreviations:

condyloid apophysis – APC; *corpus mandibulae* – CORM; *crista ramus mandibulae* – CRM; *foramen mandibulae* – FM; *fossa ramus mandibulae* – FRM; *fossa (fovea) submandibularis* – FSM; *fossa (fovea) pterygoidea* – FP; *incisura mandibulae inferior* – IMI; *incisura mandibulae superior* – IMS; *linea mylohyoidea* – LM; *processus angulus mandibulae* – PAM; *processus corpus mandibulae* – PCM; *processus condylaris* (*condyloideus*) – PCON; *processus coronoideus* – PCOR; *ramus mandibulae* – RM; *sulcus mylohyoideus* – SM; *tuberositas pterygoidea* – TP.

RESULTS AND DISCUSSIONS

Order Insectivora
Family Erinaceidae Fischer von Waldheim, 1817
Subfamily Erinaceinae Fischer von Waldheim, 1817

In *Erinaceus concolor* Martin, 1838 (Fig. 1) the inner side of the mandible has: PCOR concave centrally, with the anterior margin strongly thickened; FM is wide, U-shped, with the opening towards the inferior margin of PCON, displayed centrally in RM, under PCOR, upperly limited by a crest between CORM and the upper margin of PCON; PAM is like an axe blade, triangular in dorsal view; TP triangular on PAM; IMI semicircular; SM wide, slightly concave.

Family Soricidae Fischer von Waldheim, 1817
Subfamily Crocidurinae Milne-Edwards, 1872

Crocidura leucodon (Hermann, 1780) (Fig. 2) has: FRM as a truncated cone with the height of about 2.2 mm, in RM and the lower half of PCOR; FM placed centrally under FRM, has a small opening, semicircular, directed towards IMI, SM wide, shallow; IMI is semicircular; LM slightly prominent; FSM very superficial.

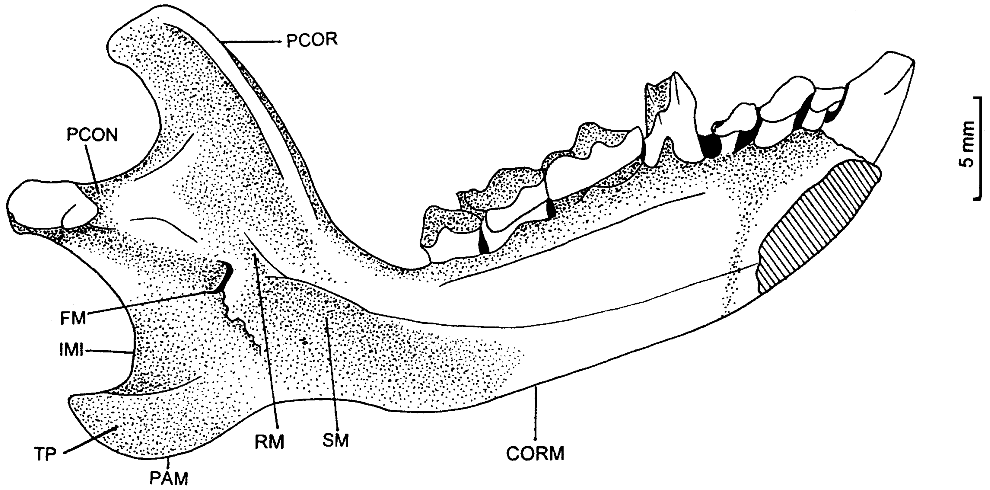

Fig. 1 – Internal lateral view of the mandible in *Erinaceus europaeus* Linnaeus, 1758.

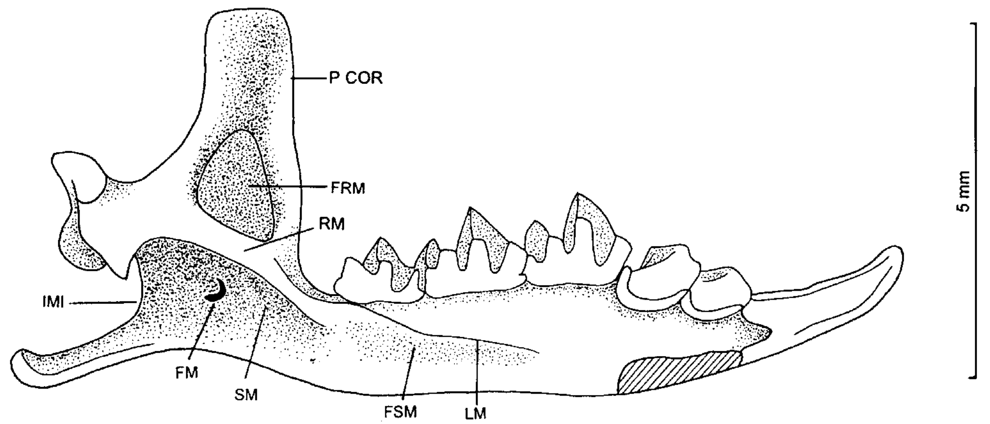

Fig. 2 – Internal lateral view of the mandible in *Crocidura leucodon* (Hermann, 1780).

Crocidura suaveolens (Pallas, 1811) (Fig. 3) has: FRM like a truncated cone, with the height of about 1.8 mm, in RM and in the lower half of PCOR, which continues with a wide ditch; FM oval, continues with a short ditch towards IMI and has the opening towards PAM; IMI semicircular; SM oval, concave, superficial; LM parallel with the teeth row; FSM superficial ditch.

Subfamily Soricinae Fischer von Waldheim, 1817

In *Sorex araneus* Linnaeus, 1758 (Fig. 4) it can be observed that: FRM like a truncated cone in RM but the largest part is in PCOR, with the height of about 2.5 mm; FM is oval, in the lower half of RM, under FRM with the oblique opening towards PCON; LM parallel with M_3-M_2, then oblique; FSM oval, elongated, narrow; SM wide, superficial; IMI approximately in right angle.

In *Sorex minutus* Linnaeus, 1766 (Fig. 5), on the inner face of the mandible it can be observed: FM oval has an opening which continues with a ditch, both of them oblique, upwards PCON; FRM like a truncate cone in RM and PCOR, with the height of about 1.8 mm; IMI is approximately in right angle; SM wide, slightly concave; LM parallel with M_3-M_2 then oblique; FSM superficial ditch.

Sorex alpinus Schinz, 1837 (Fig. 6) has: FRM like a truncated cone with the height of about 2.2 mm, displayed in RM and PCOR; IMI approximately semicircular; FM with a semicircular opening, continues with a ditch, both directed to the lower side of PCON; SM superficial, deeper centrally; LM parallel with M_3-M_1 then descending; FSM is a superficial narrow elongated depression.

Neomys fodiens (Pennant, 1771) (Fig. 7) has: FRM like a truncated cone, with the height of about 1.5 mm, in RM and at the base of PCOR, elongated with a wide ditch, superficial on PCOR; FM is under FRM, U-shaped, oblique in RM and with the opening towards IMI; SM wide, superficial, IMI approximately semicircular.

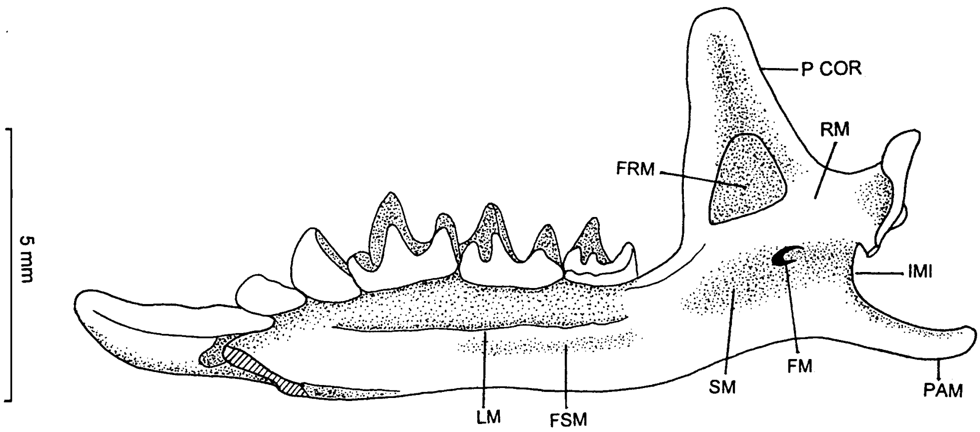

Fig. 3 – Internal lateral view of the mandible in *Crocidura suaveolens* (Pallas, 1811).

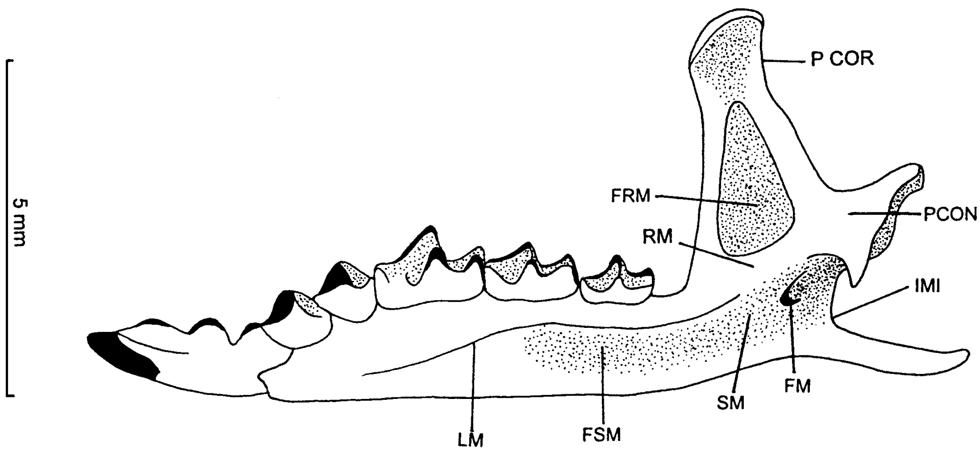

Fig. 4 – Internal lateral view of the mandible in *Sorex araneus* Linnaeus, 1758.

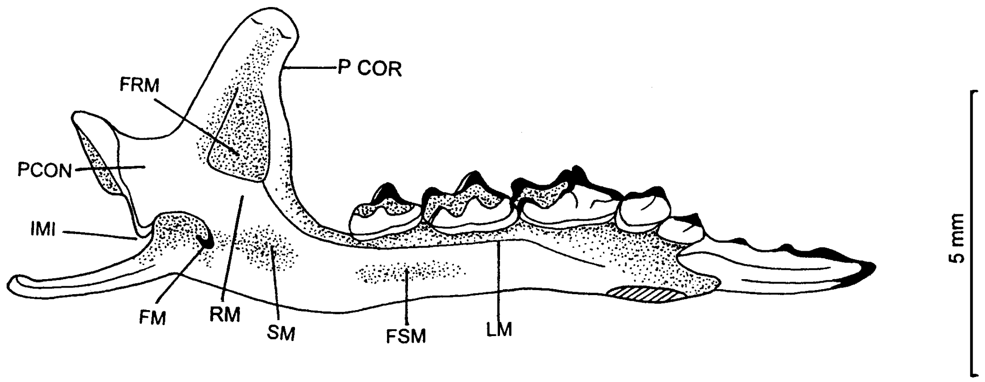

Fig. 5 – Internal lateral view of the mandible in *Sorex minutes* Linnaeus, 1766.

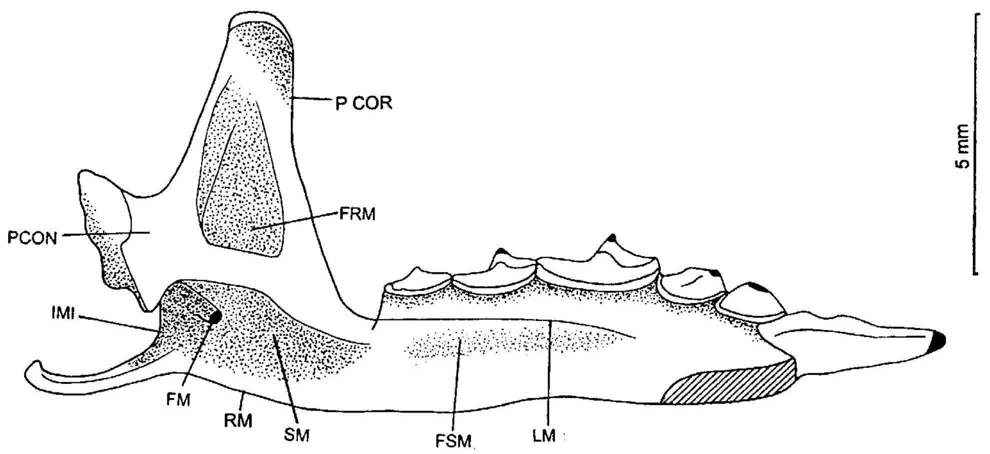

Fig. 6 – Internal lateral view of the mandible in *Sorex alpinus* Schinz, 1837.

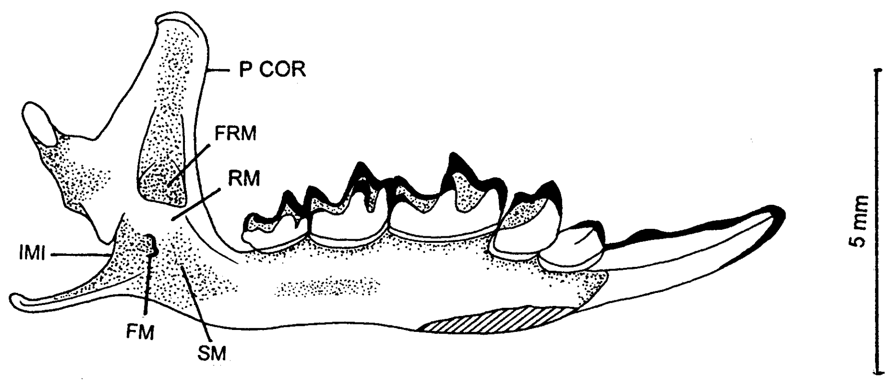

Fig. 7 – Internal lateral view of the mandible in *Neomys fodiens* (Pennant, 1771).

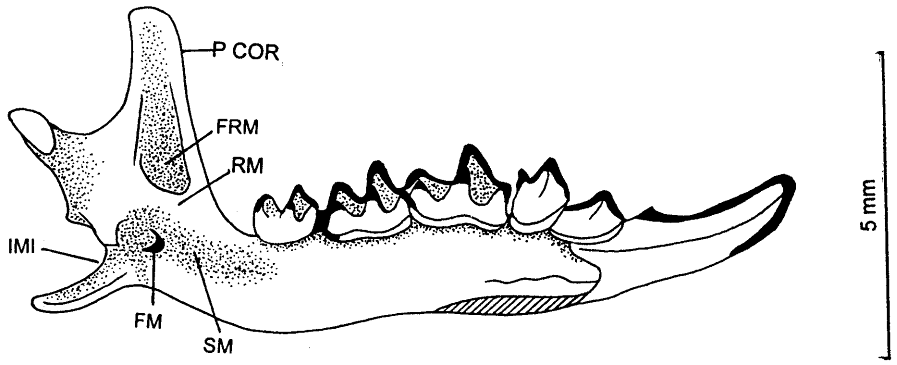

Fig. 8 – Internal lateral view of the mandible in *Neomys anomalus* Cabrera, 1907.

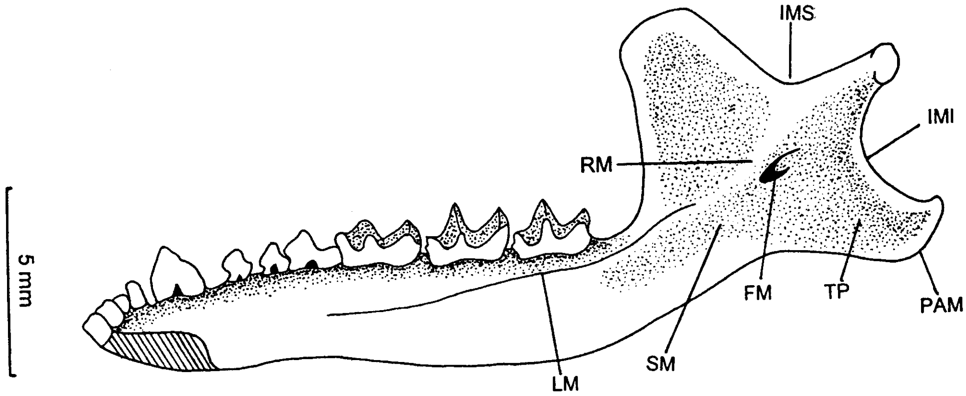

Fig. 9 – Internal lateral view of the mandible in *Talpa europaea* Linnaeus, 1758.

In *Neomys anomalus* Cabrera, 1907 (Fig. 8) the mandible has on the inner side: FRM like a truncate cone, with a height of about 2 mm, asymmetrical towards the anterior side of PCOR, disposed in RM and PCOR, where it continues with a wide ditch on PCOR; FM semicircular, oblique on RM, centrally under FRM, with the opening towards IMI; SM is a superficial ditch; IMI semicircular.

Family Talpidae Fischer von Waldheim, 1817
Subfamily Talpinae Fischer von Waldheim, 1817

Mandible in *Talpa europaea* Linnaeus, 1758 (Fig. 9) has: FM oval, near the limit between RM and PAM and under IMS, with the opening towards IMI; TP trapezoidal, centrally concave; IMI semicircular; LM oblique; SM is like a narrow short ditch.

Order Chiroptera
Family Rhinolophidae Gray, 1825
Subfamily Rhinolophinae Gray, 1825

Rhinolophus ferrumequinum (Schreber. 1774) (Fig. 10) has on the inner side: FM oval, under IMS, with the opening to IMI; SM short superficial ditch; FSM is a depression slightly deep; TP rugged concave surface on PAM; LM parallel with M_3-M_2 then oblique; IMI semicircular.

In *Rhinolophus hipposideros* (Bechstein, 1800) (Fig. 11) FM is oval, central in RM with the opening towards PCON; TP is a concave surface on PAM; SM as a superficial short ditch; IMI semicircular; LM oblique; FSM approximately triangular, slightly deep.

Rhinolophus mehelyi Matschie, 1901 (Fig. 12) has: FM semicircular, centrally displayed in RM, with the opening towards IMI; LM oblique, slightly visible; FSM slightly deep ditch; IMI semicircular.

Family Vespertilionidae Gray, 1821
Subfamily Vespertilioninae Gray, 1821

In *Myotis myotis* (Borkhausen, 1797) (Fig. 13): FM semicircular, wide, with the opening towards IMI; TP is a rugged surface on PAM; IMI in right angle; SM concave.

Myotis blythii (Tomes, 1857) (Fig. 14) has on the inner side of the mandible: FM U-shaped; IMI in right angle; SM superficial; FSM is a superficial oval surface.

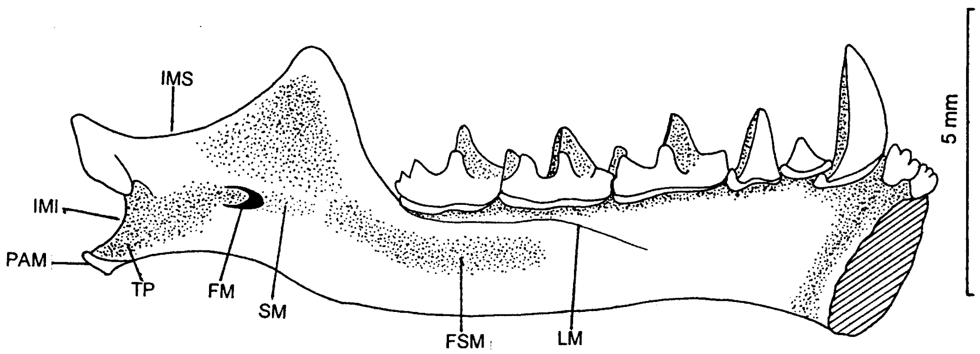

Fig. 10 – Internal lateral view of the mandible in *Rhinolophus ferrumequinum* (Schreber, 1774).

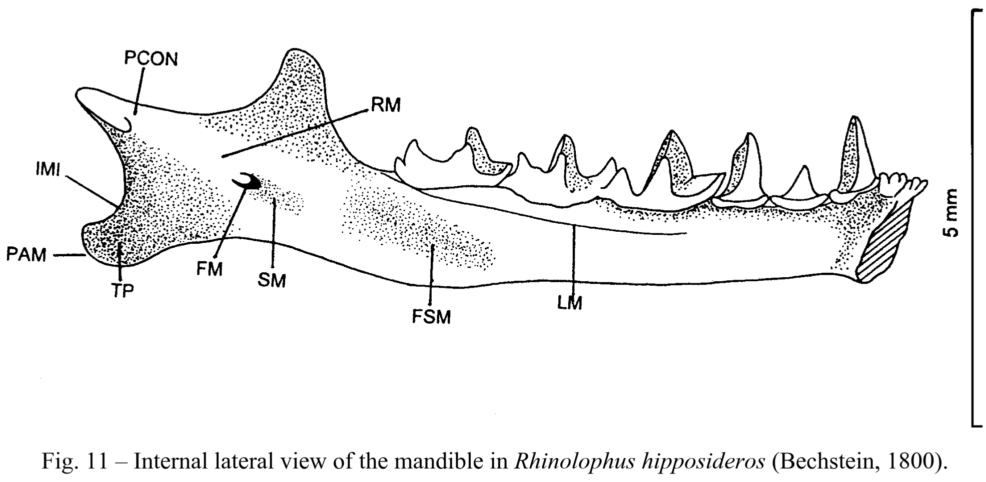

Fig. 11 – Internal lateral view of the mandible in *Rhinolophus hipposideros* (Bechstein, 1800).

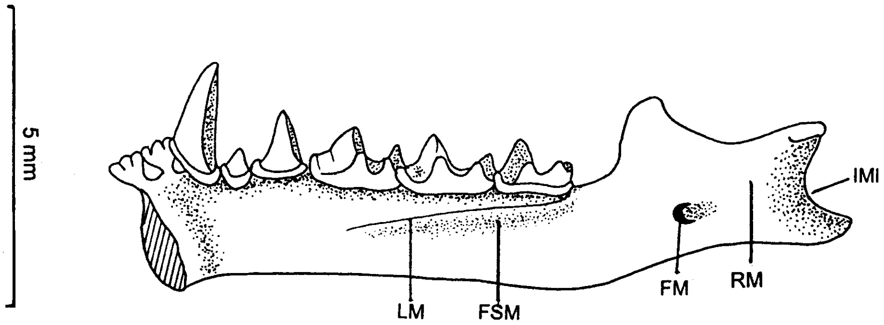

Fig. 12 – Internal lateral view of the mandible in *Rhinolophus mehelyi* Matschie, 1901.

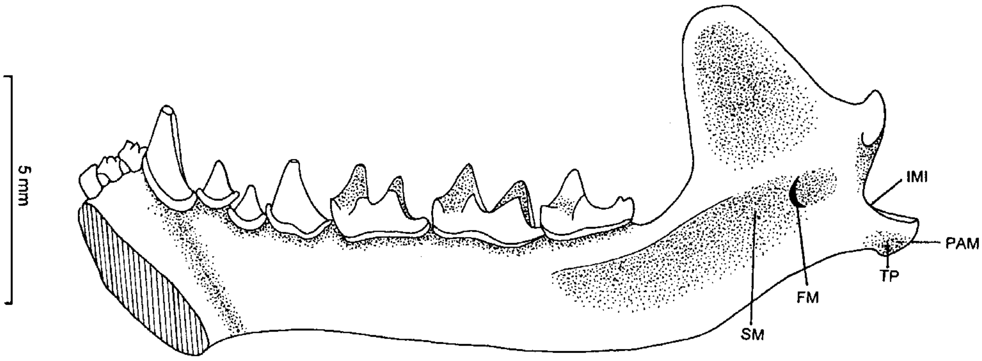

Fig. 13 – Internal lateral view of the mandible in *Myotis myotis* (Borkhausen, 1797).

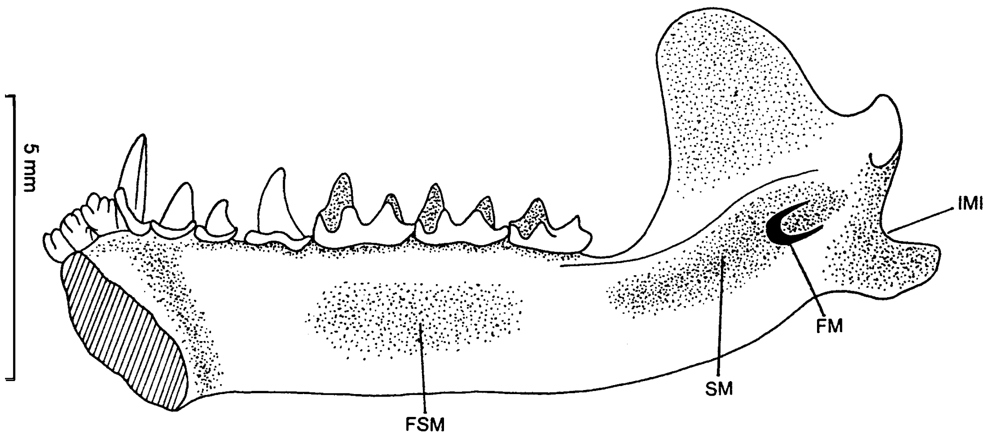

Fig. 14 – Internal lateral view of the mandible in *Myotis blythii* (Tomes, 1857).

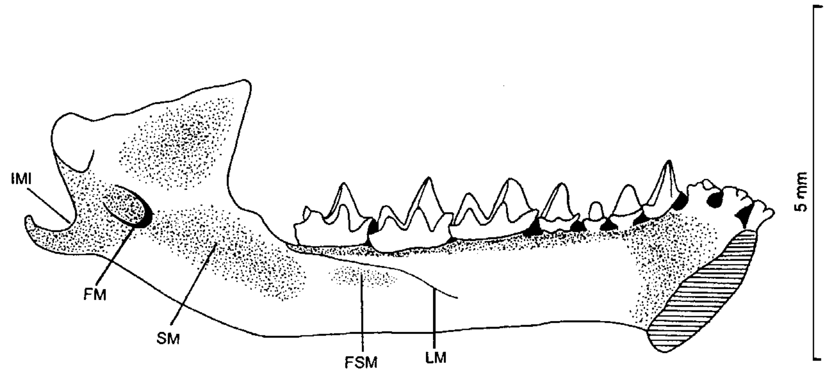

Fig. 15 – Internal lateral view of the mandible in *Myotis capaccinii* (Bonaparte, 1837).

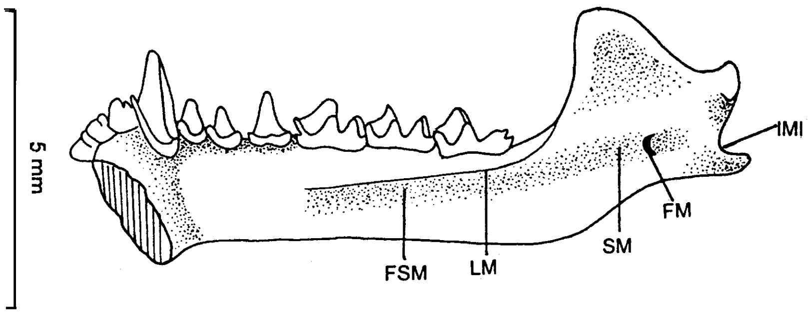

Fig. 16 – Internal lateral view of the mandible in *Myotis emarginatus* E. Geoffroy, 1806.

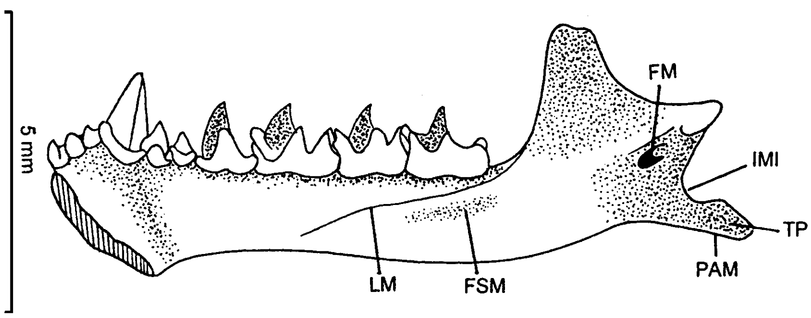

Fig. 17 – Internal lateral view of the mandible in *Plecotus austriacus* (Fischer, 1829).

In *Myotis capaccinii* (Bonaparte, 1837) (Fig. 15): FM oval, wide, with the opening to IMI; LM oblique; IMI oval; SM oval centrally deeper; FSM superficial reduced oval depression.

Myotis emarginatus (E. Geoffroy, 1806) (Fig. 16) has FM semicircular, with the opening to IMI; LM oblique, slightly prominent; SM and FSM are superficial elongated depressions; IMI in right angle.

In *Plecotus austriacus* (Fischer, 1829) (Fig. 17) it can be observed that: FM is oval, with the opening towards IMI; TP like a ditch on PAM; IMI semicircular; FSM oval-elongated, superficial; LM oblique.

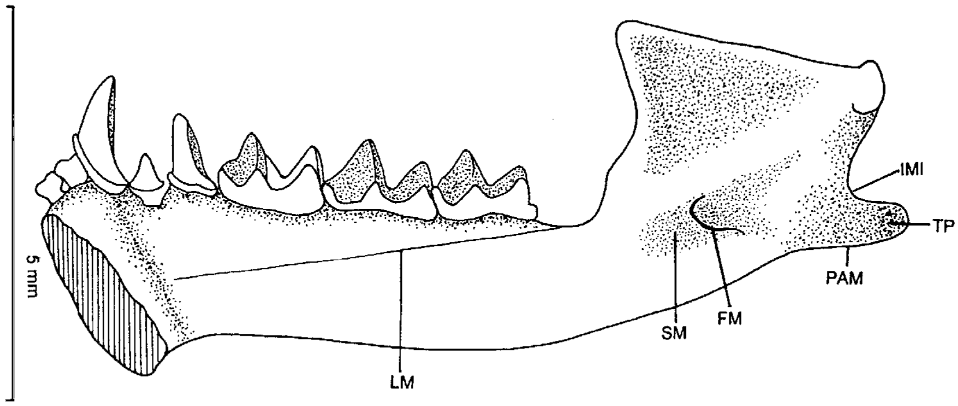

Fig. 18 – Internal lateral view of the mandible in *Vespertilio murinus* Linnaeus, 1857.

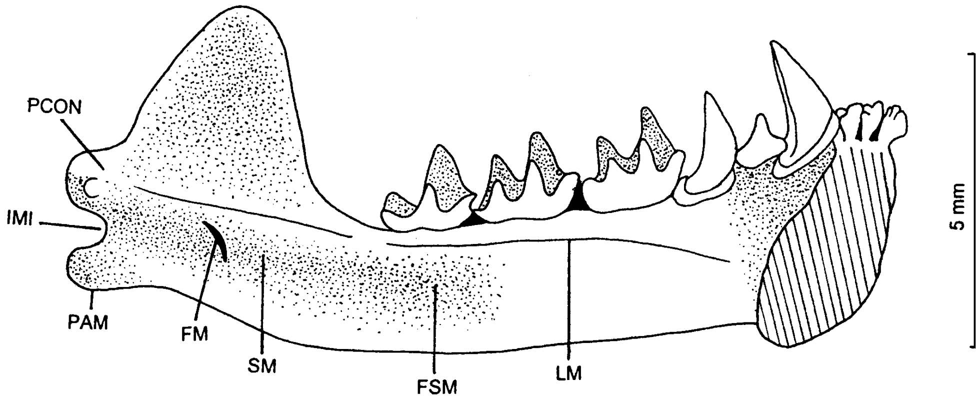

Fig. 19 – Internal lateral view of the mandible in *Eptesicus serotinus* Schreber, 1774.

Vespertilio murinus Linnaeus, 1758 (Fig. 18) has: FM semicircular, wide with the opening to IMI; TP is a rugged surface on PAM; IMI aproximately in right angle; LM oblique; SM oval, concave.

In *Eptesicus serotinus* Schreber, 1774 (Fig. 19): FM is lenticular, centrally disposed, oblique under the crest (directed from PCON to M_3) and has the opening towards PAM; SM is like an oblique superficial ditch; LM parallel with M_3–M_1, then oblique; FSM superficial concave depression; IMI like an ellipse.

Nyctalus noctula (Schreber, 1774) (Fig. 20) has: FM oval with a wide opening to IMI; LM oblique; FSM as a narrow ditch; SM is an oval depression inclined to CORM; IMI in right angle.

Pipistrellus savii (Bonaparte, 1837) (Fig. 21) has FM oval, centrally disposed in RM has an opening which continues with a ditch to PCON; SM is like a wide depression; IMI approximately in right angle.

Subfamily Miniopterinae Dobson, 1875

Inner side in *Miniopterus schreibersi* (Kuhl, 1817) (Fig. 22) has: FM U-shped, with the opening to PCON; SM superficial short ditch; FSM superficial narrow ditch; IMI semicircular; LM slightly inclined.

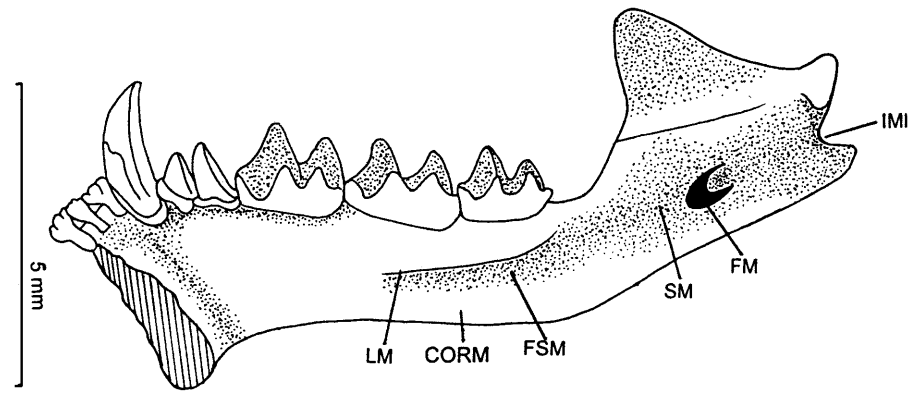

Fig. 20 - Internal lateral view of the mandible in *Nyctalus noctula* (Schreber, 1774).

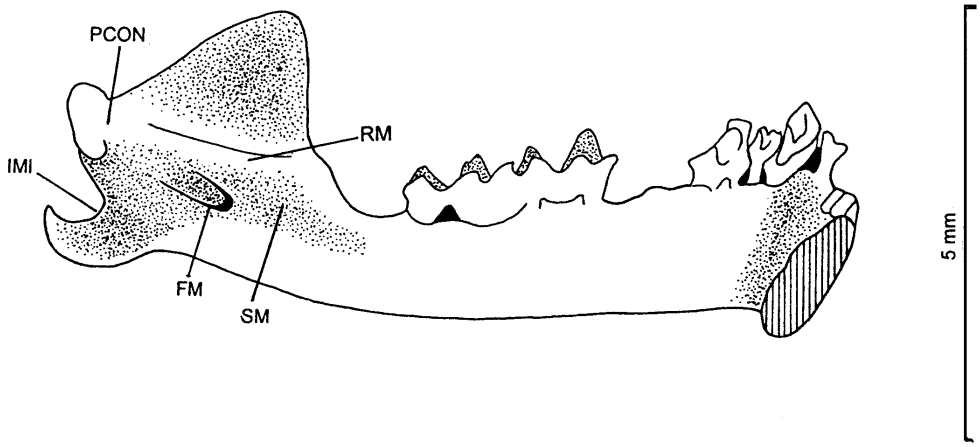

Fig. 21 – Internal lateral view of the mandible in *Pipistrellus savii* (Bonaparte, 1837).

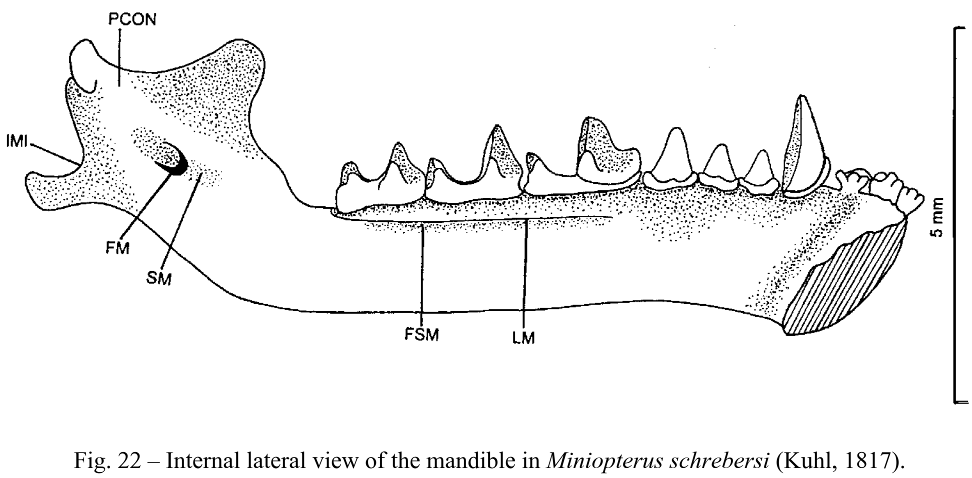

Fig. 22 – Internal lateral view of the mandible in *Miniopterus schrebersi* (Kuhl, 1817).

Order Rodentia
Family Sciuridae Hemprich, 1820
Subfamily Sciurinae Hemprich, 1820

For the inner side of the mandible in *Sciurus vulgaris* Linnaeus, 1758 (Fig. 23) characteristics are: RM displaced backwards and posteriorly in comparison with CORM; FM oval at the base of PCOR, with the opening to IMI; CRM begins from M_3 as an oblique crest towards PAM, then like a rounded mane to/in PCON; FP is triangular, lowerly limited by CRM; TP like a truncated cone on PAM (which has the anterior margin strongly thickened); IMI semicircular; LM oblique to diastema; FSM oval-elongated.

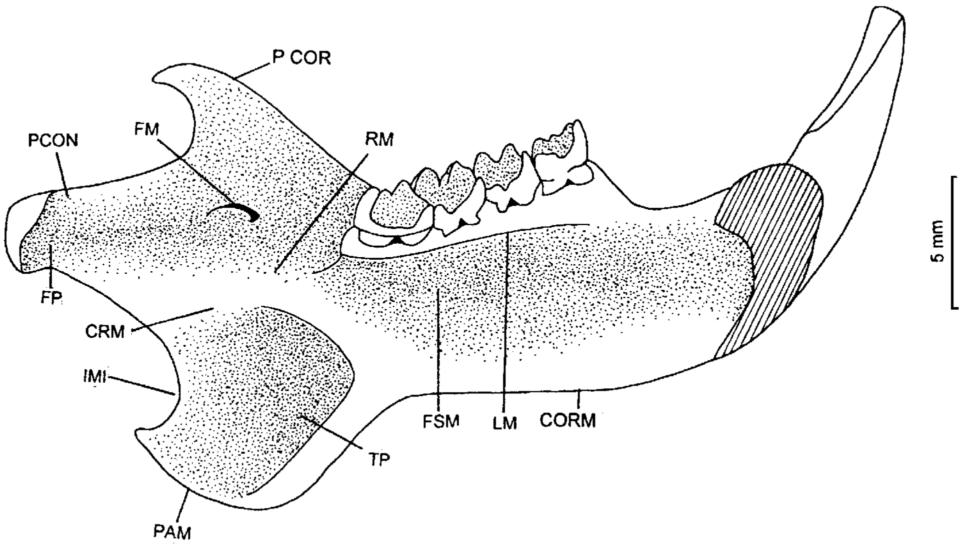

Fig. 23 – Internal lateral view of the mandible in *Sciurus vulgaris* Linnaeus, 1758.

Family Myoxidae Gray, 1821
Subfamily Myoxinae Gray, 1821

In *Dryomys nitedula* (Pallas, 1778) (Fig. 24) it can be observed that: RM slightly displaced posteriorly and backwards in comparison with CORM; CRM like a mane slightly prominent; FM centrally disposed in RM with the opening to the inner side of the mandible; TP is a rectangular concave surface; IMI semicircular; LM oblique; FSM oval-elongated, slightly coincave.

Myoxus glis (Linnaeus, 1766) (Fig. 25). On the inner side of the mandible it can be observed: RM slightly displaced backwards and posteriorly in comparison with CORM; CRM is a rounded mane from CORM to beneath FM; FM lenticular, at the base and perpendicular to PCON, with the opening towards IMI; TP is like a truncated cone, concave on PAM, centrally deeper; IMI semicircular; LM oblique; FSM oval-elongated to diastema, centrally deeper.

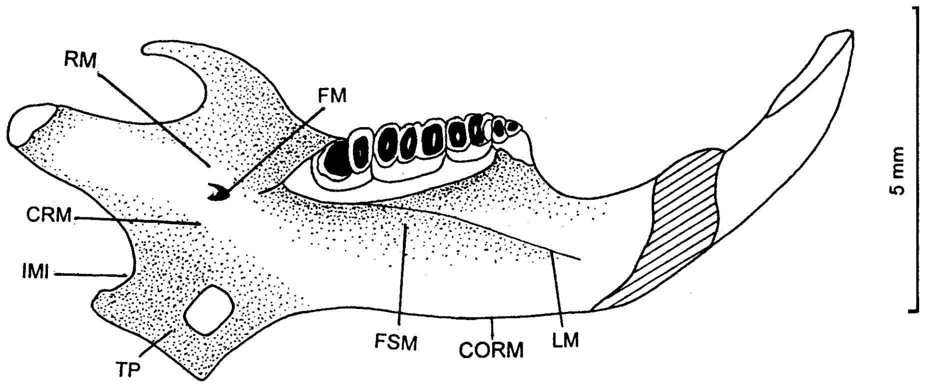

Fig. 24 – Internal lateral view of the mandible in *Dryomys nitedula* (Pallas, 1778).

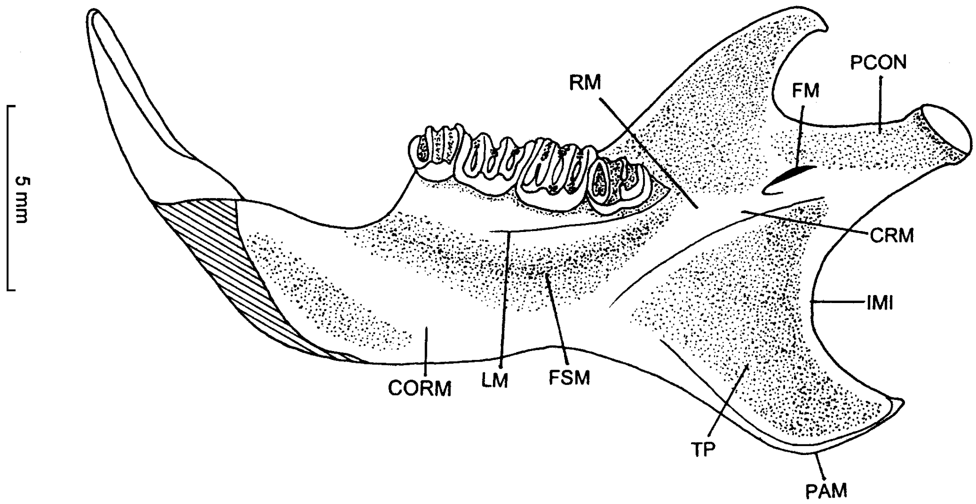

Fig. 25 – Internal lateral view of the mandible in *Myoxus glis* (Linnaeus, 1766).

Family Muridae Gray, 1821
Sufamily Arvicolinae Gray, 1821

Arvicola terrestris (Linnaeus, 1758) (Fig. 26). In inner lateral view the mandible has: RM displaced backwards and posteriorly in comparison with CORM; PCM is a trapezoidal prominence which does not exceed the lower margin of CORM; CRM is like a rounded mane from CORM to the lower side of PCON, (below of FM); TP triangular, concave; FM is lenticular, disposed perpendicular at the base of PCON and at the end of CRM, with the opening to IMI; LM oblique; IMI approximately oval; FSM is ellipsoidal, wide, centrally deeper.

Mandible of *Clethrionomys glareolus* (Schreber, 1780) (Fig. 27) has on its inner side: RM displaced backwards and posteriorly in comparison with CORM; CRM is an oblique pointed crest from M_3 to PAM, then like a rounded mane to the lower margin of PCON; FM oval, oblique, asymmetrical at the base of PCON to its

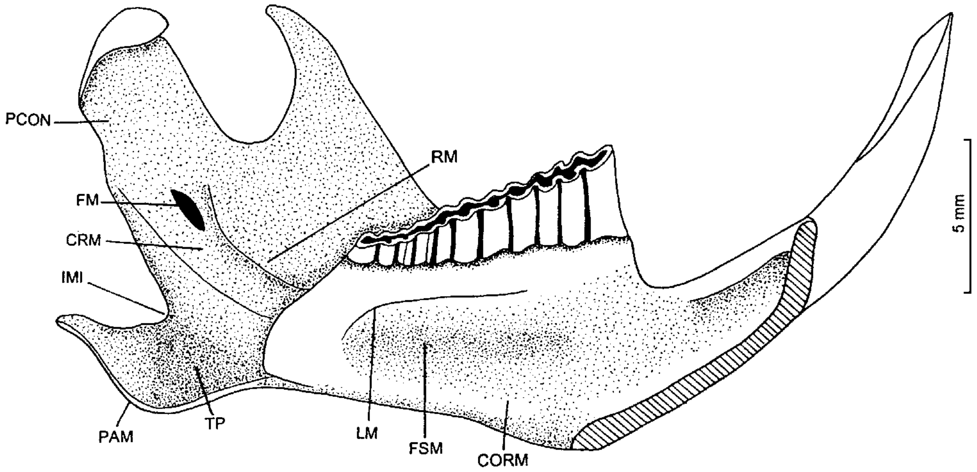

Fig. 26 – Internal lateral view of the mandible in *Arvicola terrestris* (Linnaeus, 1758).

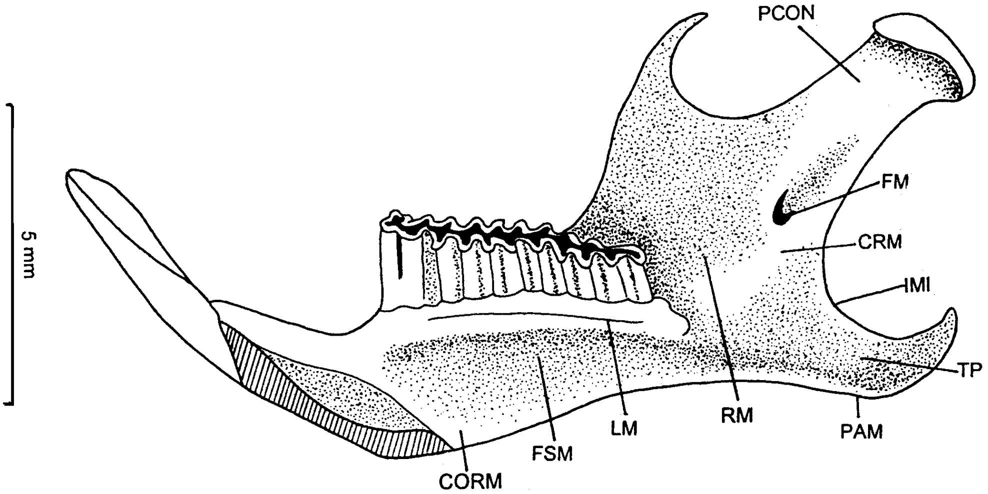

Fig. 27 – Internal lateral view of the mandible in *Clethionomys glareolus* (Schreber, 1780).

lower side with the opening to PCON; TP triangular, concave on PAM, centrally deeper; LM parallel with the teeth row; FSM oval-elongated, concave, centrally deeper; IMI oval.

Microtus subterraneus (de Sélys-Longchamps, 1836) (Fig. 28) has: RM much displaced backwards and posteriroly in comparison with CORM, PCM is a trapezoidal prominence to which the anterior corner exceed the margin of CORM; CRM is like a wide mane with a rounded surface; FM oval on the upper slope of CRM, at base perpendicular to PCON and with the opening to it; TP triangular, with the tip bent posteriorly, centrally deeper; LM oblique; FSM oval, deeper centrally; IMI oval.

Microtus arvalis (Pallas, 1778) (Fig. 29) has: RM displaced backwards an posteriorly in comparison with CORM; FM is oval, disposed at the base, perpendicular to PCON, on the upper slope of CRM, under IMS, with the opening to the buccal cavity; IMI oval; PCM trapezoidal; CRM with a rounded mane till beneath FM; TP is a triangular concave surface, with the tip posteriorly bent; FSM elliptical depression, centrally deeper.

On the inner side, the mandible of *Chionomys nivalis* (Martins, 1842) (Fig. 30) has: RM displaced backwards and posteriorly in comparison with CORM; PCM is trapezoidal; CRM as a rounded mane till beneath FM; FM oval, asimmetrically disposed towards IMI, at the base and perpendicular to PCON, at the end of CRM, with the opening towards PCON; IMI oval; TP triangular, concave, rugged on PAM; LM oblique; FSM oval-elongated towards diastema, centrally deeper.

In *Ondatra zibethicus* (Linnaeus, 1766) (Fig 31) it can be observed: RM displaced backwards and posteriorly in comparison with CORM; PCM approximately triangular, with the tip to PAM; CRM rounded mane till beneath FM;

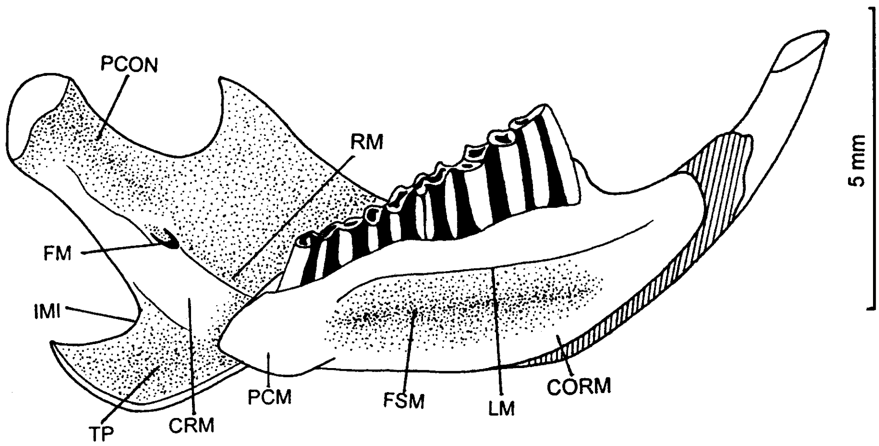

Fig. 28 – Internal lateral view of the mandible in *Microtus subterraneus* (de Sélys-Longchamps, 1836).

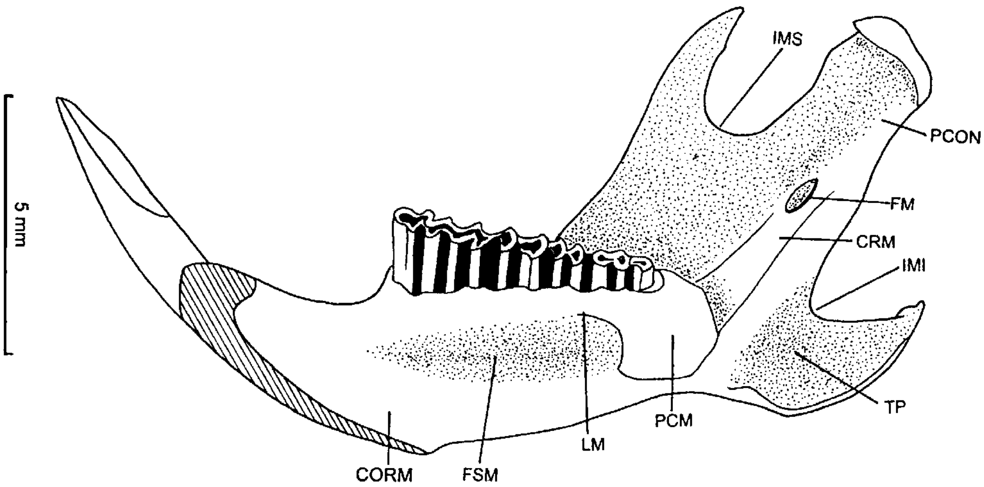

Fig. 29 – Internal lateral view of the mandible in *Microtus arvalis* (Pallas, 1778).

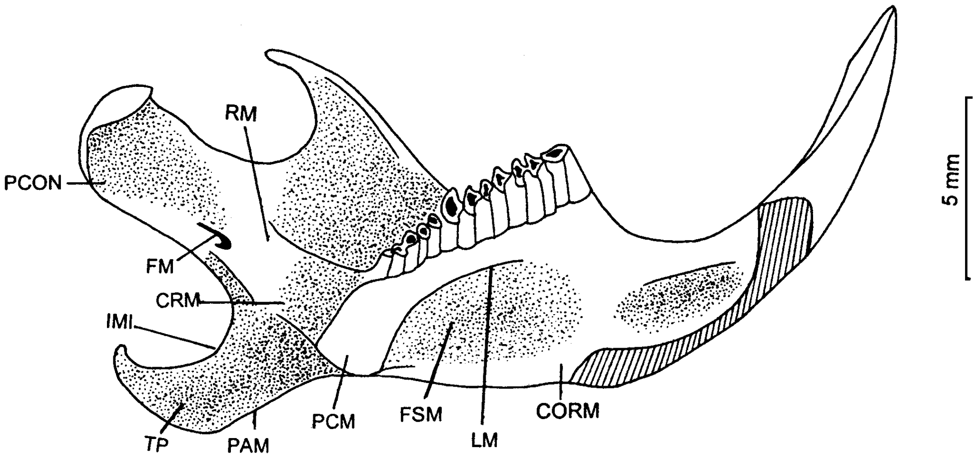

Fig. 30 – Internal lateral view of the mandible in *Chionomys nivalis* (Martins, 1842).

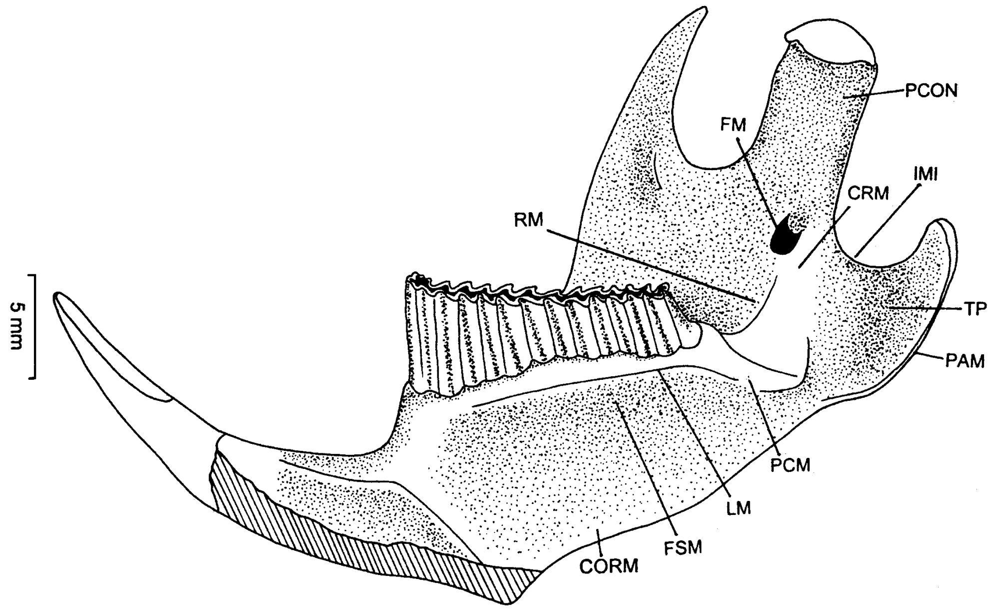

Fig. 31 – Internal lateral view of the mandible in *Ondatra zibethicus* (Linnaeus, 1776).

FM is oval, asymmetrically disposed to IMI, at the limit between RM and PCON, with the oblique opening to the lower margin of PCON; TP triangular, concave; LM parallel with the teeth row, then oblique; FSM oval-elongated, centrally deeper; IMI semicircular.

Subfamily Cricetinae G. Fischer, 1817

On the inner side of the mandible of *Cricetus cricetus* (Linnaeus, 1758) (Fig. 32) has: RM displaced backwards and posteriorly in comparison with CORM; FM

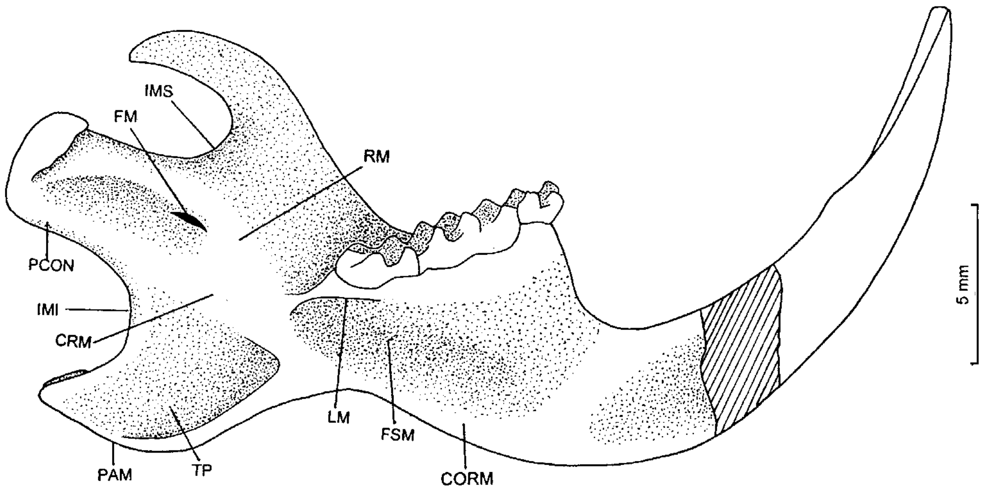

Fig. 32 – Internal lateral view of the mandible in *Cricetus cricetus* (Linnaeus, 1758).

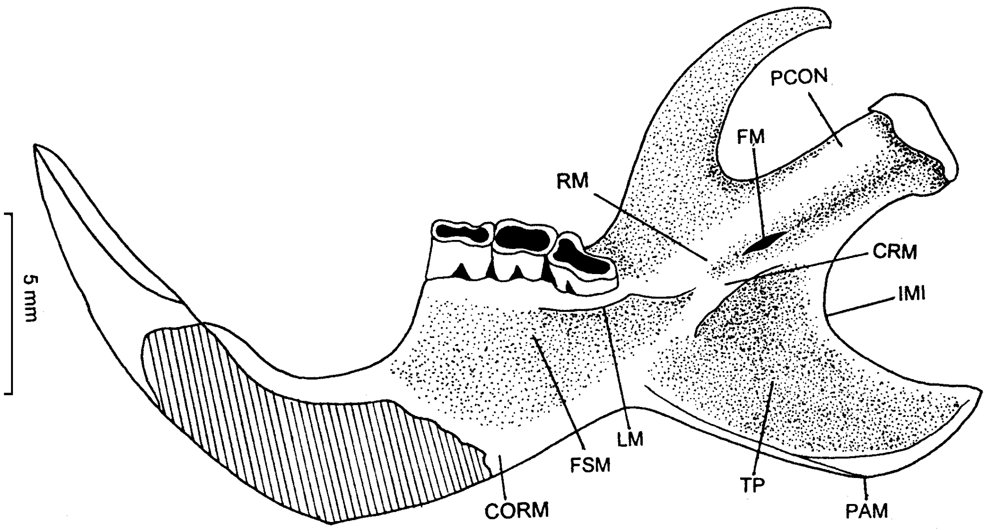

Fig. 33 – Internal lateral view of the mandible in *Mesocricetus* newtoni (Nehring, 1898).

lenticular, at the base and perpendicular to PCON, slightly asymmetrically towards IMS, with the opening to IMI, bordered upperly by a crest along PCON; CRM is a short crest, oblique towards PAM, then a rounded mane till beneath FM; PAM as a triangular blade, with the anterior margin thickened; TP trapezoidal, concave; LM oblique, slightly prominent; FSM oval-elongated, concave, centrally deeper; IMI is semicircular.

Mesocricetus newtoni (Nehring, 1898) (Fig. 33) has: RM displaced backwards and posteriorly in comparison with CORM; FM lenticular, with the opening towards PAM, disposed at the base of PCON, perpendicular to it and upperly limited by a mane from PCON; CRM is a short crest, oblique towards PAM, then a rounded mane till beneath FM; TP trapezoidal, concave; LM oblique; IMI semicircular; FSM oval-elongated, centrally deeper.

In *Cricetulus migratorius* (Pallas, 1773) (Fig. 34) it can be observed: RM displaced backwards and posteriorly in comparison with CORM; FM is lenticular under PCOR, perpendicular to PCON, with the opening to PAM; CRM is a short crest, oblique towards PAM, then a rounded mane to the lower margin of PCON; IMI oval; TP triangular, concave, centrally deeper; LM oblique; FSM oval, with a larger concavity centrally.

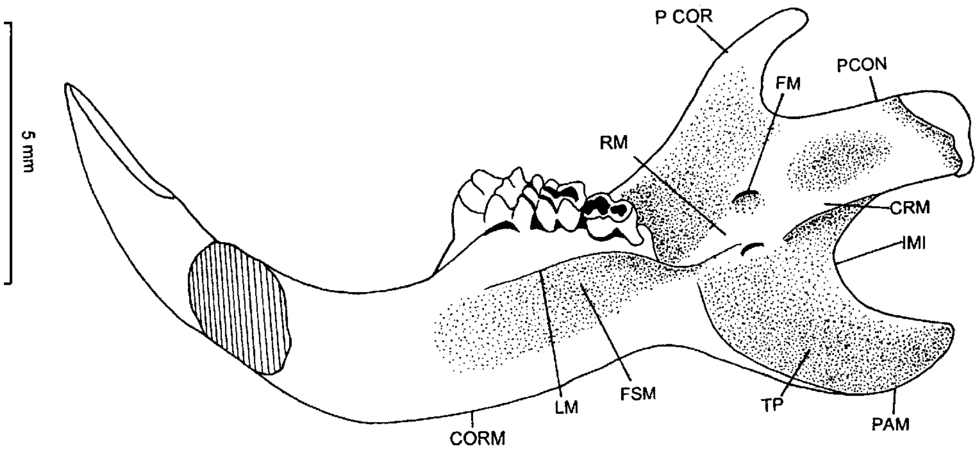

Fig. 34 – Internal lateral view of the mandible in *Cricetulus migratorius* (Pallas, 1773).

Subfamily Murinae Illiger, 1815

Rattus norvegicus (Berkenhout, 1769) (Fig. 35). In inner lateral view, the mandible has: RM with PCOR backwards and posteriorly in comparison with CORM; FM lenticular in RM, at the limit with PCOR and the opening to PCON; FP

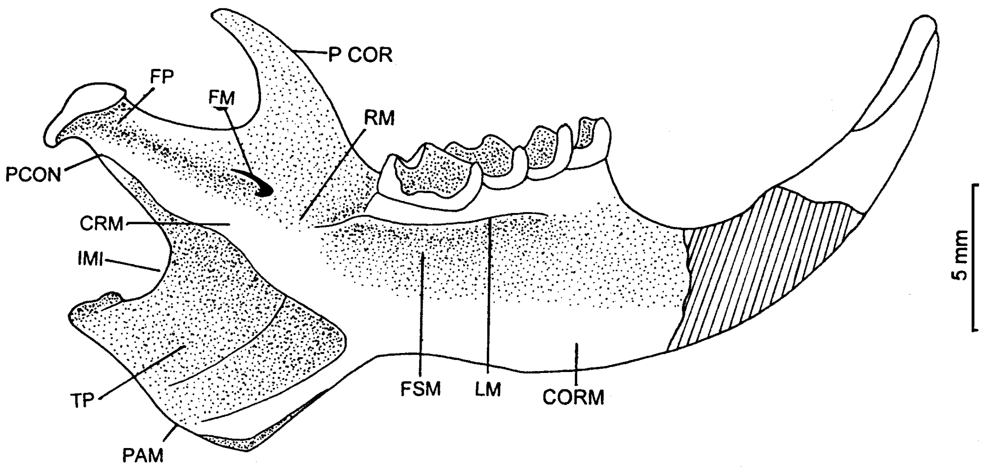

Fig. 35 – Internal lateral view of the mandible in *Rattus norvegicus* (Berkenhout, 1769).

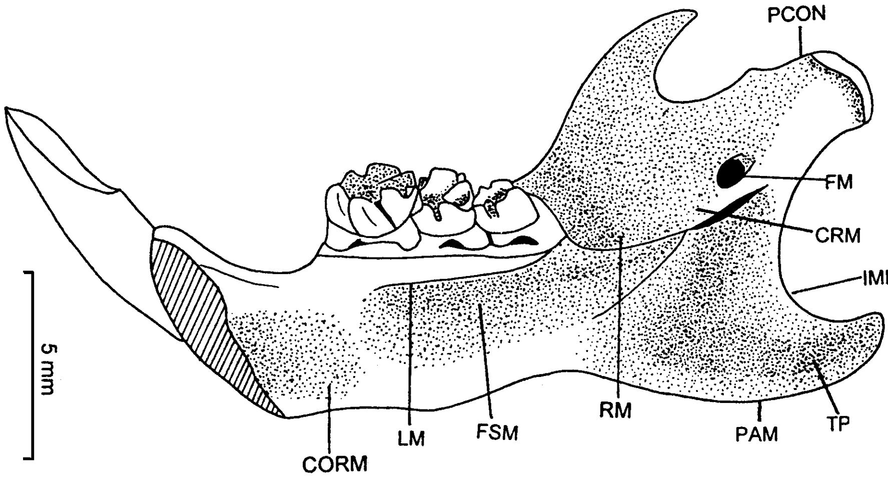

Fig. 36 – Internal lateral view of the mandible in *Rattus rattus* (Linnaeus, 1758).

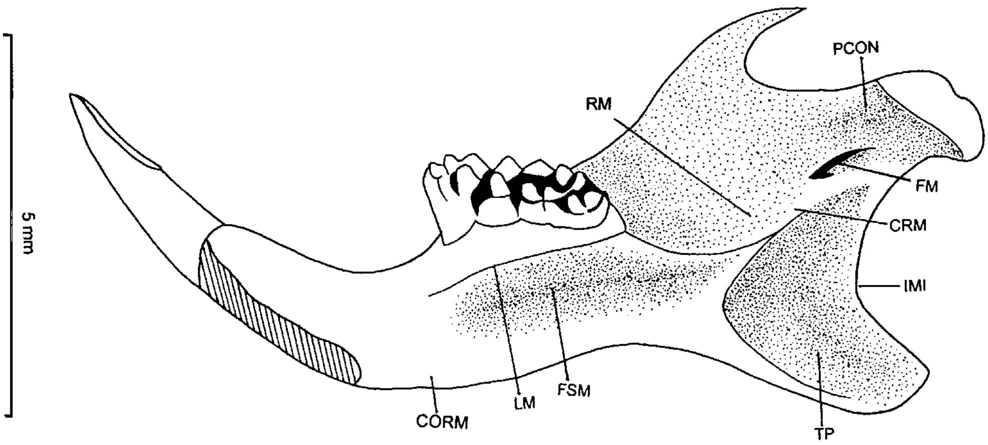

Fig. 37 – Internal lateral view of the mandible in *Mus musculus* Linnaeus, 1766.

triangular, continues on PCON with a ditch till FM; CRM as a rounded mane, elongated on the lower side of PCON; PAM has the anterior margin strongly thickened; TP approximately a square with an oblique concavity from the hind-lower corner to the fore-upper one; LM prominent, slightly oblique; FSM wide, concave; IMI semicircular.

Rattus rattus (Linnaeus, 1758) (Fig. 36) has: RM backwards and posteriorly in comparison with CORM; CRM as an eaves from M_3 convex to PAM, then straight till PCON; FM oval, wide, at the base of PCON, asymmetrically towards IMI, with the opening to PCON; TP approximately trapezoidal, concave; LM oblique; FSM oval-elongated, deeper centrally; IMI is semicircular.

In *Mus musculus* Linnaeus, 1766 (Fig. 37) RM is backwards and posteriorly in comparison with CORM; FM is lenticular elongated at the base and perpendicular

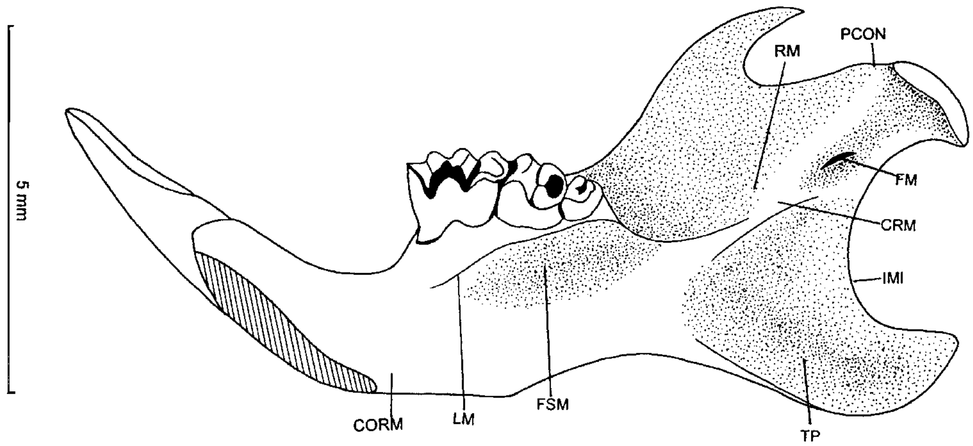

Fig. 38 – Internal lateral view of the mandible in *Mus spicilegus* Petenyi, 1882.

to PCON, asymmetrically to IMI; IMI semicircular; CRM begins from FM and it is rounded in the first half, then pointed towards M_3; TP trapezoidal, concave centrally; LM oblique; FSM is an concave oval area.

Mus spicilegus Petenyi, 1882 (Fig. 38) has: RM backwards and posteriorly in comparison with CORM; FM is at the base and perpendicular to PCON, asymmetrically to IMI (smaller than in *Mus musculus* Linnaeus, 1766); IMI semicircular; CRM begins from FM and like an horizontal stretched "S" till M_3; TP trapezoidal, concave centrally; LM oblique; FSM concave oval area.

Subfamily Spalacinae Gray, 1821

In the inner side of the mandible of *Nannospalax leucodon* (Nordmann, 1840) (Fig. 39) it can be observed: RM has APC and PCOR behind the teeth row; CRM has a strong mane, continuing with the lower margin of CORM, rounded; FM is oval

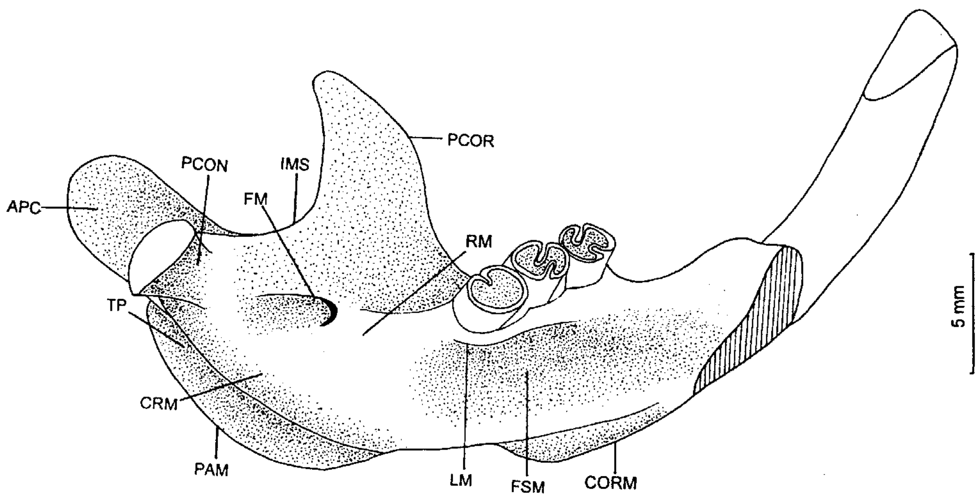

Fig. 39 – Internal lateral view of the mandible in *Nanospalax leucodon* (Nordmann, 1840).

in RM, under IMS, with the opening to PCON; TP elongated, narrow, rugged along the PAM; LM oblique; FSM oval with a deeper concavity centrally, towards diastema.

Conclusions

The structures observed in the mandible (RM, PCOR, PCON, CAPM, IMI, IMS, PAM, FRM, PCM, CRM, SM, LM, FSM, FM) have characteristic size, shape, position, thickness, direction to the species or genus. On the inner side of the mandible in Soricidae *fossa ramus mandibulae* (FRM) is specific, and for some rodents, *crista ramus mandibulae* (CRM) and *processus corpus mandibulae* (PCM). Thus, the characteristics of the mandible connected to the other features of the species or genus can be taken into consideration in identification.

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MORFOLOGIA FEŢEI INTERNE A MANDIBULEI LA MICROMAMIFERE (MAMMALIA: INSECTIVORA, CHIROPTERA, RODENTIA) DIN ROMÂNIA

REZUMAT

În lucrare este descrisă şi ilustrată faţa internă a mandibulei de la 39 specii de micromamifere (Mammalia: Insectivora, Chiroptera, Rodentia), din fauna României.

Craniile studiate provin din colecţiile ştiinţifice ale Muzeului Naţional de Istorie Naturală "Grigore Antipa" (Bucureşti).

Autorul face propuneri pentru denumirea unor structuri observate pe faţa internă a mandibulei – *fossa ramus mandibulae, processus angulus mandibulae, crista ramus mandibulae, processus corpus mandibulae, incisura mandibulae superior, incisura mandibulae inferior*. Descrierea feţei interne a mandibulei completează cunoaşterea morfologiei sale.

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