figs.1-2; pl. 2, fig. 1); Geological Survey of Hungary, Budapest
Locus typicus: Budapest, XIVth district, Hungary
Age: Late Badenian (Early Serravallian), Middle Miocene

Material:
Early Badenian (Langhian-Early Serravallian) – Retznei [Weissenegg Fm., Lafarge quarry (formerly Perlmoser)], Styria, Austria
WANZENBÖCK coll.: 2 specimens (no inv. nos.)
Badenian (Langhian-Early Serravallian) – Bad Fischau, NÖ, Austria
NHMW: 1 specimen (NHMW 1904.VIII.62)
Badenian (Langhian-Early Serravallian) – Brunn am Steinfeld, NÖ, Austria
NHMW: 2 specimens (NHMW 2004z0001/0048, 2004z0001/0051)
Badenian (Langhian-Early Serravallian) – Hainburg (*Halitherium* locality of STACHE, 1867), NÖ, Austria
NHMW: 1 specimen (NHMW 1867.XXII.3)
Badenian (Langhian-Early Serravallian) – Haschendorf, W Deutschkreutz, Bgld, Austria
NHMW: 5 specimens (NHMW 1848.III.63-64, 1848.III.66, 2004z0001/0052, 2004z0001/0060)
Badenian (Langhian-Early Serravallian) – Hasenberg, near Brunn am Gebirge, NÖ, Austria
NHMW: 2 specimens (NHMW 1904.VIII.61, 2004z0001/0047)
Badenian (Langhian-Early Serravallian) – Kalksburg, Vienna, Austria
NHMW: 12 specimens [NHMW 1857.38.21, 1857.38.22, 1858.III.13-14, 1858.XXV.40, 1904.VIII.56, 1904.VIII.57 (figured specimen of SCHAFFER, 1962: pl. 15, fig. 2) 1904.VIII.58, 1904.VIII.59 (**lectotype** of *Scutella vindobonensis* LAUBE, 1869), 2004z0001/0059, 2004z0072/0002, 2004z0111/0001]
Badenian (Langhian-Early Serravallian) – Neckenmarkt, Bgld, Austria
NHMW: 6 specimens [NHMW 291/1961, 390/1961 (**holotype** of *Scutella multiconcava* SCHAFFER, 1962: pl. 18, figs. 1-2), 391/1961 (figured specimen of SCHAFFER, 1962: pl. 15, fig.3), 1964/590 (figured specimen of SCHAFFER, 1962: pl. 17, fig. 4), 2004z0001/0055-56, 2004z0001/0058]
Badenian (Langhian-Early Serravallian) – Oslip, Bgld, Austria
NHMW: 1 specimen (NHMW 1976/1843/18) and numerous test fragments (NHMW 2003z0083/0006)
Badenian (Langhian-Early Serravallian) – Pötzleinsdorf, Vienna, Austria
NHMW: 1 specimen (NHMW 2004z0072/0001)
Badenian (Langhian-Early Serravallian) – Rauchstallbrunngraben, near Baden, NÖ, Austria
NHMW: 1 specimen (NHMW 2004z0001/0062)
Badenian (Langhian-Early Serravallian) – Siegenfeld, Gaaden Bay, NÖ, Austria
NHMW: 1 specimen (NHMW 2004z0111/0002)
Late Badenian (Early Serravallian) – Müllendorf (Mühlendorfer Kreide AG quarry), Bgld, Austria
NHMW: 19 specimens (NHMW 1981/55/20, 1997z0178/1754, ../1756-1757, 2002z0181/0023-34, 2004z0112/0009-11),
Late Badenian (Early Serravallian) – Unterpetersdorf (= Alsópéterfa), Bgld, Austria
NHMW: 2 specimens [MAFI Ech-283 (reference material of VADÁSZ, 1915)]

Foreign material for comparison:
Badenian (Langhian-Early Serravallian) – "Bia gravel", Soskút, Hungary
NHMW: 4 specimens (NHMW 1865.XXX.78-80)
Remark: According to VADÁSZ (1915: 105, footnote) there are only strata of Sarmatian age outcropping at Soskút and material from the marine Badenian comes from the nearby Leitha Limestone of Bia.
Badenian (Langhian-Early Serravallian) – Kemence, Hungary
NHMW: 1 specimen (NHMW 2004z0001/0054)
Late Badenian (Early Serravallian) – Armeniş (= Örményes), Romania
NHMW: 2 specimens and 1 fragment [MAFI Ech-290-292 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Biatorbágy (= Bia), near Budapest, Hungary
NHMW: 3 specimens [NHMW 1859.XLIII.26; MAFI Ech-137 (figured specimen of VADÁSZ, 1915: fig. 12), ? MAFI Ech-228 (**holotype** of *Scutellina hungarica* VADÁSZ, 1915: pl. 10 (4), figs. 2-3)]
Late Badenian (Early Serravallian) – Budatétény (= Tétény), Hungary
NHMW: 1 specimen (NHMW 1997z0178/2090)
Late Badenian (Early Serravallian) – Buituri (= Bujtur), Romania
MAFI: 2 specimens [MAFI Ech-240 (figured specimen of VADÁSZ, 1915: fig. 14), Ech-264 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Devínska Nová Ves (= Neudorf an der March), Slovak Republic
NHMW: 1 fragment (NHMW 1857.XIX.46), 8 specimens [NHMW 1851.VI.120, 1851.VI.120.6, 1866.I.1256, 1929.No.16, 1964/589 (**holotype** of *Scutella vindobonensis secunda* SCHAFFER, 1962: pl. 19, fig. 4), 2004z0001/0046, 2004z0111/0003], 2 partially leached specimens (NHMW 1859.XXXVIII.100)
Late Badenian (Early Serravallian) – Sandberg, Devínska Nová Ves (= Neudorf an der March), Slovak Republic
NHMW: 3 specimens (NHMW 2004z0001/0050). 2 partially leached and fragmented specimens (NHMW 2004z0001/0049)
? Late Badenian (Early Serravallian) – Gârbova de Sus (= Felsö-Orbó), Romania
NHMW: 2 specimens [MAFI Ech-130 (figured specimen of VADÁSZ, 1915: fig. 16), Ech-234 (figured specimen of VADÁSZ, 1915: fig. 15)]
Late Badenian (Early Serravallian) – Globu Craiovei (= Globukrajova), Romania
NHMW: 1 specimen and 1 fragment [MAFI Ech-286, 289 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Harka, Györ-Moson-Sopron, Hungary
NHMW: 1 specimen [MAFI Ech-284 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Iablanitja (= Bélajablánc), Romania
NHMW: 1 specimen [MAFI Ech-282 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Minişu des Sus (= Felménes), Romania
NHMW: 1 specimen and 1 fragment [MAFI Ech-285, 288 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Paptelek, Hungary
NHMW: 1 specimen [MAFI Ech-263 (reference material of VADÁSZ, 1915)]
Late Badenian (Early Serravallian) – Sopron (= Ödenburg), Hungary
NHMW: 1 specimen (NHMW 2004z0001/0053)
Late Badenian (Early Serravallian) – Tusa (= Tusza), Romania
NHMW: 1 specimen and 2 fragments [MAFI Ech-287 (reference material of VADÁSZ, 1915), Ech-158 (figured specimen of VADÁSZ, 1915: fig. 17)]

Dimensions (in mm)**:**

Inv. No.	TL	TW	TH
NHMW 1997z0178/1756	158.6	172.5	28.9
NHMW 1997z0178/1757	125.5	137.8	20.1

NHMW 1964/589	133.3	~140	21.5
NHMW 390/1961	95.8	99.4	20.0
NHMW 1964/590	92.6	102.3	~17
NHMW 1904.VIII.59	150.3	163.8	30.6

Description:
Size and shape: Test large to very large, ranging from 15 (juvenile specimen with gonopores still closed) to 159 mm TL. In a 44.6 mm TL specimen the gonopores are still closed. The outline of the test is subcircular, slightly transversely elongate (rarely antero-posteriorly elongated individuals are found, most of these, however, show a regenerated marginal area and thus do not show the characteristic outline of this species). The anterior margin is rounded with shallow indentations corresponding to the ad-, inter- and perradial sutures. The posterior margin is transversely truncated, with two strong indentations corresponding to the perradial sutures of the ambulacra I and V. The anal notch is shallow but distinct and rather broad. In juveniles and specimens with thicker coronal plates (i.e. specimens from high-energy settings, e.g. from Neckenmarkt), however, it may be deeper. The maximum width lies slightly posterior of the apical disc, at the line interambulacra 1b-4a. In profile the test is distinctly wedge shaped, with a thicker, rounded anterior margin and a thinner, relatively sharp posterior margin. The maximum height lies 10 to 13 % of the TL posterior of the centre of the apical disc along the central suture of interambulacrum 5. The test width is about 103 to 110 % of the TL and the height about 13-25 % of the TL.
Apical disc: The apical disc lies subcentrally and belongs to the tetrabasal type. The madreporite is pentagonal and crowded with many small madreporic pores. Four gonopores are situated at the apices of the madreporite, except in interambulacrum 5. The ocular pores are small and rounded.
Ambulacra: The ambulacra are petaloid. The petals are straight, moderately closed distally and are usually flush with the interambulacra (rarely they may be slightly depressed). They extend about two third of the corresponding test radius. The frontal petal is slightly shorter than the anterior paired petals, which in turn are slightly short than the posterior paired petals. The ambulacra pores within the petals are septate conjugated isopores. That means that the two pores in each pair are connected by an extremely elongated, narrow groove, which deepens towards the adradial pore. Contrary to the condition in most other clypeasteroid echinoids (Smith, 1980c) (see Fig. 37.A-C), the adradial pair of this groove is subdivided by numerous vertical septae (see Fig. 37.D-E). Outside the petals only minute micro-unipores are found. Each poriferous zone is about 1.4 to 1.9 times as wide as the interporiferous zone.
Interambulacra: The interambulacra are covered by small, crenulate, perforate tubercles, which are slightly larger adorally than adapically.
Food grooves: The food grooves are restricted to the oral surface, they are simple in smaller and more complex in larger specimens, where many secondary grooves branch from the main grooves. They bifurcate at about 17 to 20 % of the corresponding test radius from the peristome. From this point on they run along the midline of each ambulacral plate column. Just before they reach the ambitus, they bend in direction of the interambulacra.
Peristome: The peristome is situated subcentrally on the oral surface and has a circular outline. It is about 4.5 mm in diameter in a 125 mm specimen.
Periproct: The periproct is small, rounded to oval (transversely elongated) with a diameter of 2 to 2.5 mm. It lies marginally along the interradial suture of interambulacrum 5 between the 3rd pair of postbasicoronal plates (Fig. 36), usually around 6 % TL from the posterior margin. A very shallow, broad groove connects it with the posterior test margin. In juvenile specimens (up to *c.* 25-30 mm) the periproct may lie marginally within the anal notch.

Differential diagnosis:
The type species of *Parascutella*, *Ps. leognanensis* (Lambert, 1903) from the Early Miocene of Western France, differs from *Ps. gibbercula* by its flatter profile, without conspicuous elevation in adapical interambulacrum 5, its broader interporiferous zones and more closed petals [compare Agassiz, 1841a (under the name *Scutella subrotunda*) and Durham, 1953].

Parascutella paulensis (Agassiz, 1841), from the Burdigalian of the Mediterranean and Eggenburgian to Karpatian of the Central Paratethys, likewise differs from *Ps. gibbercula* by its less strongly developed marginal indentations, its rounded posterior margin without or with faint anal notch, and flattened profile with central maximum height.

Parmulechinus hoebarthi (Kühn, 1936) from the Early Eggenburgian (Early Burdigalian) differs from *Parascutella gibbercula* by it shorter petals (*c.* half the length of the corresponding test radius), its antero-posteriorly elongated outline, and the different position of its peristome (between the 4th or 5th pair of postbasicoronal plates).

For the difference between *Ps. gibbercula* and *Ps. jaquemeti* (de Loriol, 1902), *Ps. striatula* (de Serres, 1829), *Ps. michaleti* (Lambert, 1906), *Ps. depereti* (Lambert, 1912), and *Ps. savini* (Lambert, 1915) the reader is referred to Philippe (1998).

Discussion:
Originally the species was named *Scutella gibercula* by de Serres (1829: 156). Agassiz (1841a: 86) changed the name to *S. gibbercula* (there is no indication whether the change was intentional or unintentional). According to the ICZN rules this represents an unjustified emendation or incorrect subsequent spelling. The name *S. gibbercula* is in prevailing usage during the last 150 years and is attributed to the original author and date of the original spelling. According to the ICZN it is therefore deemed to be a justified emendation, respectively a correct original spelling (in case of an unintentional change) (ICZN 4th ed., 2000, Article 33.2.3.1, respectively Article 33.3.1).

Because of the marginal position of the periproct between the 3rd pair of postbasicoronal plates and the long petals (two third of the corresponding test radius), this species is placed into the genus *Parascutella* Durham, 1953, as proposed by Philippe (1998) already.

Specimens of this species found in the Miocene of Austria and its neighbouring countries were long known under the name *Scutella vindobonensis* Laube, 1871. However, apart from the fact that the name was already established in 1869, *S. vindobonensis* is a junior synonym of *S. gibbercula* de Serres, 1829. Both the original diagnosis of de Serres (1829: 156) and subsequent descriptions and illustrations by Lambert (1912: 73-74; pl. 5, figs. 1-2) and Philippe (1998: 150-51; pl. 15, figs. 7a-d) correspond very well to the present material including Laube's holotype. This was already suggested by Vadász (1915: 117-118), who considered *S. gibbercula* as local variety of *S. vindobonensis*. Szörényi (1953: 64), however, rejected this and stated that those two are separate species based on the following features: 1) *S. gibbercula* has no deep anal notch only a shallow indentation; 2) a slightly concave oral surface; 3) a posteriorly eccentric apex; 4) a frontal ambulacrum which is shorter than the paired ambulacra; and 5) interporiferous zones which are slightly smaller than a single poriferous zone. Comparing these features with the material at hand it is apparent that all these features are also present in the specimens originally classified as *S. vindobonensis*, even in the holotype. The only differences that can be observed between *S. gibbercula* specimens from France and specimens of the Central Paratethys formerly classified as *S. vindobonensis* are the more strongly inflated interambulacrum 5 and that the thicker ambitus in the latter. There are, however, numerous specimens which do not show these differences, or which are intermediate. For such specimens the nominal subspecies *vindobonensis planata* Kókay and *vindobonensis secunda* Schaffer have been established. The close relation between *gibber-*

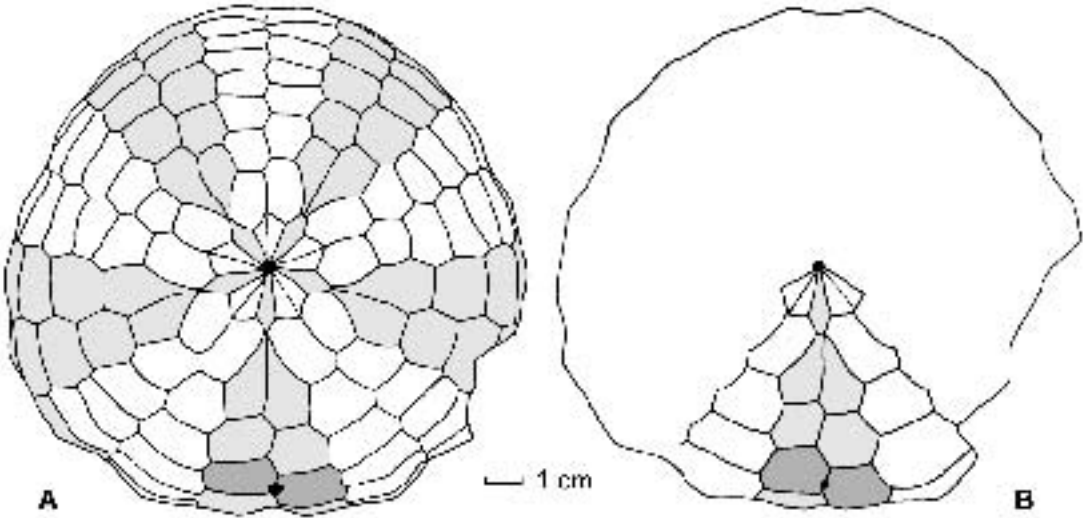

Figure 36: *Parascutella gibbercula* (de Serres, 1829): oral plating [A: Kalksburg, Vienna (NHMW 2004z0111/0001); B: holotype of *Scutella vindobonensis secunda* Schaffer, 1962, Sandberg, near Devínska Nová Ves (Neudorf an der March), Slovak Republic (NHMW 1964/589)]. Interambulacra shaded in light grey; postbasicoronal plate pair enclosing the periproct shaded in dark grey.

cula and *vindobonensis* have already been observed by Lambert (1912: 74) and Philippe (1998: 151). Since all other features are identical and the overlap of the former features is very large a clear distinction on species or even subspecies level is not possible. Moreover, these features seem to be correlated to the substratum on/in which the animals lived, since the conditions typical for the *vindobonensis*-morphology is developed in larger specimens coming from carbonate environments, whereas they are no present in specimens coming from predominantly siliciclastic sediments. Consequently *Ps. vindobonensis* is considered a junior synonym of *Ps. gibbercula* here.

A number of subspecies have been established within *S. vindobonensis*: *S. vindobonensis planata* Kókay, 1960 *in* Somos & Kókay, 1960 and *S. vindobonensis secunda* Schaffer, 1962, for specimens with a lower test profile and thinner margin; and *S. vindobonensis altus* Mihály, 1990 for specimens with especially high test profile. However, since neither of these subspecies is characteristic for a certain time slice or region and they occur erratically, as do other extreme morphotypes, they are poorly justified. Moreover they are connected by numerous intermediate morphologies and any separation would be highly artificial.

Scutella kalksburgensis Wiesbaur, 1974 a species based on a single specimen from the type locality of *S. vindobonensis*, is also considered a junior synonym of *S. gibbercula* de Serres, 1829 (see above under type-material).

In 1962 Schaffer established a number of new "*Scutella*"-species (now referred to *Parascutella*) from the Middle Miocene of Austria. According to Schaffer (1962) his *Scutella styriaca* is characterised by its profile and its constant "Marginopetalabstand" of 28-30 mm (distance between tip of the petals and the margin of the test). The latter feature, albeit repeatedly used by Schaffer (1962) is poorly suited for distinguishing scutellid species. During the growth of the animals this distance increases. If used at all it can only be employed for specimens of similar size or if expressed as relation (e.g. percentage of the TL). In scutellids, however, the relative length of the petals is very constant within genera. In *Parascutella* the petals usually extend about two third and in *Scutella* usually half of the corresponding test radius. The test profile is better suited to distinguish between species, but still can vary strongly within a single species, especially between specimens from different palaeoenvironments. In the case of *styriaca* the profile is nearly identical with that of specimens Schaffer himself placed into another species (*S. vindobonensis secunda*; compare Schaffer, 1962: fig. 9 with fig. 11). Comparing large series of scutellids with TL ranging form *c.* 15 mm to more than 150 mm coming from various localities throughout the Central Paratethys it becomes evident that variation of profile can be quite strong. Within *Ps. gibbercula* the profile ranges from a very flat type to a very high markedly triangular shape. These differences have been used to establish subspecies (*secunda*, *planata* and *altus*) within *Ps. vindobonensis*, a junior synonym of *Ps. gibbercula* (see above). As stated above, these subspecies are, however, highly artificial as they are connected by series of intermediate morphotypes and occur all sympatric and synchronous. Moreover, *Ps. gibbercula* shows allometric growth and relative test height (and triangularity of the profile) decreases with increasing size. A constant feature of *Ps. gibbercula* is the presence of a bulge in adapical interambulacrum 5. The inflation of this bulge varies, but it is always present and coincides with the maximum test height. Schaffer's statement that such a bulge is not present in *S. styriaca* (Schaffer, 1962: 154) is not true as can be seen on his fig. 9 and in the material itself. There are no features which allow confident recognition of this species. Therefore, *S. styriaca* is considered as yet another junior synonym of *Ps. gibbercula*.

Similarly the species *Scutella multiconcava* Schaffer, 1962 cannot be maintained as separate species. The characteristic features provided by Schaffer (1962) include small size, a strong bulge in adapical interambulacrum 5, a constant "Marginopetalabstand" of 17 mm, inframarginal position of the periproct, a semicircular anal notch and strongly branched food grooves. As discussed above the "Marginopetalabstand" is poorly suited to characterise scutellid species. The bulge in adapical interambulacrum 5, albeit certainly very prominent in Schaffer's specimens, is shared by all the nominal species discussed here. The same is valid for the inframarginal position of the peristome and the anal notch. Only the strong branching of the food grooves is peculiar for *S. multiconcava*. Yet, this is also poorly suited as diagnostic feature since the depth and exact arrangement of the food grooves varies strongly between individuals. The smaller size, higher profile and as a whole more "stout" appearance might be an adaptation to the local palaeoenvironment (e.g. higher energy, different sediment,...). *S. multiconcava* is thus considered a local morphotype and junior synonym of *Ps. gibbercula*.

Scutella szoerenyiae Mihály, 1969 is based on a single specimen with wavy margin. The latter and the deep anal notch, as well as the large test height were considered as diagnostic features distinguishing this species from *S. vindobonensis* by Mihály (1969: 255). The wavy margin, however, is a clear sign of regeneration following sub-lethal predation, a feature commonly encountered in fossil and extant sand dollars (e.g. Vadász, 1914, 1915; Frazer et al., 1991; Nebelsick, 1999; Kowalewski & Nebelsick, 2003; Lawrence et al., 2004). As regeneration in these echinoids does not reproduce the original outline but rather seals scars and gaps in the skeleton this feature could also be an explanation for the unusual deep anal notch. As other diagnostic features are absent *S. szoerenyiae* is here considered a junior synonym of *Ps. gibbercula*. Mihály (1985: 259) stated that *S. szoerenyiae* is closely related to *Abertella aberti* and "*Scutella" floridana* (the latter is a junior synonym of the former according to Cooke, 1959: 44-45). Apart from slight superficial similarities in overall shape, however, there is no relation between these species and Mihály's species, apart from the fact that they are members of the suborder Scutellina.

The specimens attributed to the species *Scutella hungarica* (Vadász, 1914), *Scutella pygmea* Koch, 1887b, *Scutella romani* Mihály, 1985 and *Scutella muelleri* Mihály, 1985 are characterised by their small size and the fact that all occur within a single locality and horizon. Based on the comparison with growth series of *Ps. gibbercula* from Austrian localities these specimens are here considered as juvenile and subadult specimens of *Ps. gibbercula* (which, under the name *S. vindobonensis*, was reported from the same locality). The changing position of the periproct from an aboral-supramarginal position to a marginal and finally submarginal position is very characteristic for the ontogeny of scutelline echinoids and was documented for *Dendraster excentricus* by Durham (1953: 102) and could also be shown for *Parmulechinus hoebarthi* (this paper, see below under that species). There are no features that would allow any of these "species" to be distinguished from juvenile *Ps. gibbercula* and consequently *S. romani* and *S. muelleri* are placed into the synonymy of the former. Obviously the idea that part of his material might be juvenile specimens never came to Mihály's mind, as can also bee seen by the fact that he established a new genus and species for juveniles of *Amphiope* in the same paper (see below).

The type material of both *Scutella pygmea* Koch, 1887b and *Scutellina hungarica* Vadász, 1915 are poorly preserved juvenile scutellids. They are tentatively placed into the synonymy of *Ps. gibbercula* here based on the high similarity to juveniles of that species (see also above under "Type-material") and the co-occurrence of adult specimens of *Ps. gibbercula*.

Szörényi (1953) described a large number of different scutellid species, among them a new species and a new subspecies, from the Early Badenian of the western Ukraine. The specimen figured as *S. vindobonensis* by Szörényi (1953: pl. 1, figs. 4, 4a) clearly belongs to *S. gibbercula* (based on outline, profile and shape of the petals). The specimens figured as *Scutella paulensis* by her are more difficult to determine. Apparently they have few marginal indentations, a rather low profile and narrow petals. Yet the specimens are uncharacteristic for *Parascutella paulensis* (compare illustrations in Philippe, 1998). They are here tentatively referred to *Ps. gibbercula*, but need to be re-examined to confirm this placement. The strong weathering of the specimens may account for the rather narrow appearance of the petals (contrary to the rather broad petals of typical *Ps. gibbercula*). *Scutella eichwaldi* and *S. almerai parva* are subadult specimens that fall well within the variation observed in *Ps. gibbercula* and are tentatively referred to this species here.

Philippe (1998: 143, 145) referred the material figured as *Scutella leognanensis* by Vadász (1915) to *Ps. striatula* (de Serres, 1829). Based on a re-examination of these two specimens they are here tentatively referred to *Ps. gibbercula*. They differ from the typical *Ps. gibbercula* by their less strong marginal indentations and rounded posterior margin (the margin of one specimen is, however, strongly regenerated and that of the other specimen damaged, hampering comparison), the very shallow or lacking anal notch and low profile with the maximum height subcentrally. They could also be related to *Ps. paulensis*, which is known at least until the Karpatian (Late Burdigalian) of the Central Paratethys and may also have been present in the Early Badenian. A relation to the poorly known *Ps. striatula* (de Serres, 1829) [see Cottreau (1913a: 88-92, figs. 15-16), Negretti (1984: 106-107; pl. 5, figs. 4-5, pl. 6, fig. 3) and Philippe (1998: 143-145; pl. 15, figs. 1-3)] seems to be unlikely, as this is a form with very distinct marginal indentations in the ambulacra, a strong anal notch and is until now only known from the Burdigalian of France.

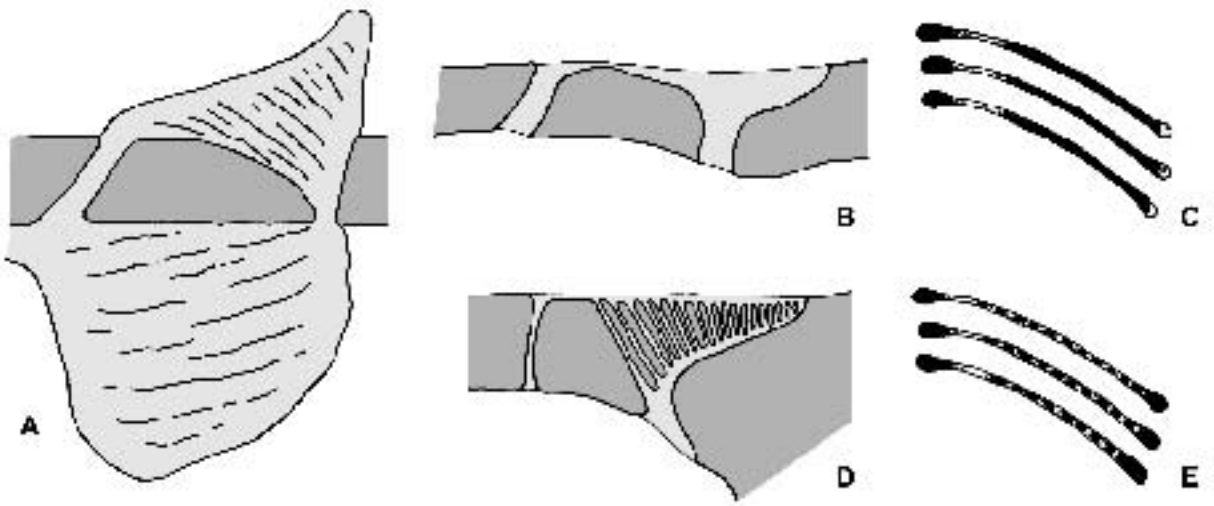

Figure 37: Comparison of respiratory pore structure in *Parascutella* vs. that typical for other scutelline sand dollars. A: section through a respiratory tube foot in extant *Mellita quinquiesperforata* (redrawn from Smith, 1984); B-C: vertical section (B) and aboral view (C) of a typical elongate isopore in the petals of a scutelline sand dollar (*Mellita quinquiesperforata*); D-E: vertical section (D) and aboral view (E) of a septate pore in the petals of a *Parascutella* (*Ps. gibbercula*).

Occurrence:

Austria: Early to Late Badenian (Langhian-Early Serravallian

Vienna Basin: Brunn am Steinfeld, NÖ (Karrer, 1877; Schaffer, 1962; [NHMW]); Bad Fischau, NÖ (Plöchinger & Karanitsch, 2002; [NHMW]); Dornbach, Vienna (Schaffer, 1906); Hainburg, NÖ (Laube, 1869a, 1871; [NHMW]); Hasenberg, near Brunn am Gebirge, NÖ (Karrer, 1877; Schaffer, 1962; [NHMW]); Kalksburg, Vienna (Fuchs, 1869; Laube, 1869a, pp 1871; Stur, 1873; Wiesbaur, 1874; Quenstedt, 1874, 1875; Karrer, 1877; Schaffer, 1907; Abel, 1922; Schaffer, 1942; Schaffer, 1962; Thenius, 1962a; Müller, 1964, 1978; [NHMW]); Müllendorf (Mühlendorfer Kreide AG quarry), Bgld (Kapounek, 1939; Schaffer, 1962; [NHMW]); Perchtoldsdorf, NÖ (Karrer, 1877); Pötzleinsdorf, Vienna (Sieber, 1953b; Thenius, 1970; [NHMW]); Rauchstallbrunngraben, near Baden, NÖ (Schaffer, 1962; [NHMW]); Steinabrunn, NÖ (Sieber, 1958a; Schaffer, 1962); Steinberg, near Niederkreuzstetten, NÖ (Schaffer, 1962); Vienna Basin (Thenius, 1974)

Eisenstadt-Sopron Basin: Oslip, Bgld ([NHMW])

Oberpullendorf Bay: Haschendorf (= Hasfalva), W Deutschkreutz, Bgld (Laube, 1869a, 1871; Vadász, 1915; Schaffer, 1962; [NHMW]); Neckenmarkt, Bgld (Janoschek, 1931; Schaffer, 1962; [NHMW]); Ritzing, Bgld (Quenstedt, 1874, 1875; Janoschek, 1931); Unterpetersdorf (= Alsópéterfa), Bgld, Austria (Wolf, 1870; Laube, 1871; Vadász, 1915; [MAFI])

Styrian Basin: Retznei (Weissenegg Fm., Lafarge quarry), Styria ([Wanzenböck coll.]); between St. Georgen and Pichla, Styria (Kollmann, 1965); Tittenberg (probably identical with Leibnitz-Seggauberg), south-west Leibnitz, Styria (Schaffer, 1962); "Grazer Bucht" (Schaffer, 1959); Stiefingbach, Pesendorf, near Wildon, Styria (Kollmann & Rögl, 1978; [NHMW])

Paratethys (non-Austrian occurrences): Early to Late Badenian (Langhian-Early Serravallian)

Vienna Basin: Devínska Nová Ves (= Neudorf an der March), Slovak Republic (Schaffer, 1962; [NHMW]); Sandberg, Devínska Nová Ves (= Neudorf an der March), Slovak Republic (Schaffer, 1962; [NHMW])

Eisenstadt-Sopron Basin: Fertörákos, Györ-Moson-Sopron, Hungary (Vendl, 1930); Harka (= Harkau), Györ-Moson-Sopron, Hungary (Wolf, 1870; Vadász, 1915; Mihály, 1969; [MAFI]); Sopron, Györ-Moson-Sopron, Hungary (? Foetterle, 1860; [NHMW])

Great Hungarian Basin (Pannonian Basin): Biatorbágy (= Bia), Pest, Hungary (Lóczy, 1887; Vadász, 1915; Schaffer, 1962; Mihály, 1969, 1985; Kókay et al., 1984; [NHMW]; [MAFI]); Bodolyaber (= Egyházbér), Baranya, Hungary (Vadász, 1915; Mihály, 1969); Budapest, Xth district, Hungary (Mihály, 1985); Budapest, XIVth district, Hungary (Mihály, 1990); Budapest-Gyakorló, Hungary (Mihály, 1985); Budapest-Kerepesi, Hungary (Mihály, 1985); Budapest Rákos, Hungary (Franzenau, 1881; Vadász, 1906, 1915; Mihály, 1969, 1985); Érd, Pest (Vadász, 1915); Érdliget, Pest, Hungary (Mihály, 1969); Hidas, Hungary (Vadász, 1915); Hird, Hungary (Somos & Kókay, 1960); Hor. Strháre (= Felsö-Esztergály), Slovak Republic (Gaál, 1905); Kemence, Nógrád, Hungary (Májer, 1915; Schaffer, 1962; Mihály, 1969; [NHMW]); Kisgeresd, Baranya, Hungary (Vadász, 1915; Mihály, 1969); Mátraverebély, Nógrád, Hungary (Mihály, 1969); Ösagárd, Nógrád, Hungary (Vadász, 1915; Mihály, 1969); Paptelek, Hungary (Vadász, 1915; [MAFI]); Sámsonháza, Nógrád, Hungary (Mihály, 1969); Soskút, Pest, Hungary (Laube, 1869a, 1871; Schaffer, 1962; [NHMW]); Szatina, Baranya, Hungary (Vadász, 1915; Mihály, 1969)

Fore-Carpathian Basin: ? Bilka, Ukraine (Eichwald, 1830; Pusch, 1837); Velyki Birky (= Borki-Wielkie), near Tarnopol, western Ukraine (Szörényi, 1953); Kurzany, near Kovo-Bircza, western Ukraine (Szörényi, 1953; Schaffer, 1962); ? Salisce (Salisze), Ukraine (Eichwald, 1830; Pusch, 1837); Zhukov (= Zukowce, = Shukowze), western Ukraine (? Eichwald, 1830; ? Pusch, 1837; ? Eichwald, 1852, 1853; Szörényi, 1953; Schaffer, 1962); ? Zalesce (= Zalezce), western Ukraine (Szörényi, 1953; Schaffer, 1962)

Transylvanian Basin: Armeniş (= Örményes), Romania (Vadász, 1915; [MAFI]); Brăteşti, Beiuş Basin, NW Romania (Codrea, 1981); Buituri (= Bujtur), Romania (Koch, 1887b; Nemes, 1888b; Lörenthey, 1894; Mártonfi, 1894; Vadász, 1915; [MAFI]); Felsö-Orbó, Romania (Koch, 1887b; Gaál, 1905; ? Vadász, 1915; [MAFI]); Globu Craiovei (= Globukrajova), Romania (Vadász, 1915; [MAFI]); Iablanitja (= Bélajablánc, Romania) (Vadász, 1915; [MAFI]); Lăpugiu des Sus (= Lapugy), Romania (Schaffer, 1962); Minişel (= Kresztaménes), Arad, Romania (Vadász, 1915); Minişu des Sus (= Felménes), Romania (Lóczy, 1887; Vadász, 1915; [MAFI]); région E de Taşad, Romania (Paucă, 1936); Tusa (= Tusza), Romania (Vadász, 1915; [MAFI])

Zala, Sáva and Dráva Basins: Derventa and Ugljevik, Bosnia & Herzegovina (Mitrović-Petrović, 1969)

Varna Gulf: Murfatlar, Basarabi, Romania (Saraiman, 1988)

Mediterranean: Serravallian to Tortonian

Rhône Basin: Cabrière-d'Aigues, south of the Luberon hills, Vaucluse, France (Lambert, 1912; Philippe, 1998); Cadenet, south of the Luberon hills, Vaucluse, France (des Moulins, 1837; Agassiz, 1841a; Lambert, 1912; Philippe, 1998); Cucuron, south of the Luberon hills, Vaucluse, France (Lambert, 1912; Roman, 1974; Philippe, 1998); Vaugines, south of the Luberon hills, Vaucluse, France (Lambert, 1912; Philippe, 1998); Vaucluse, France (Cottreau, 1913a)

Eastern Mediterranean: Karaman, Turkey (Roman, 1960)

Parascutella paulensis (Agassiz, 1841)

(Pl. 43, Figs. 1-2; Pl. 44, Figs. 1a-d)

	1841a	*Scutella paulensis* Ag. – Agassiz: 83; pl. 19, fig. 8-10
	1858	[*Scutella*] *Paulensis* Agass. – Desor: 233
pp	1871	*Scutella Vindobonensis* Laube. – Laube: 62; pl. 17, fig. 1
?	1892	*Scutella paulensis*, Agassiz. – Gourret: 130
?	1907a	*Scutella paulensis* Agassiz, 1841. – Lambert: 43; pl. 3, figs. 1-2
	1912	*Scutella paulensis* Agassiz, 1841 – Lambert: 64-66; pl. 4, fig. 10-13
	1913a	*Scutella paulensis* Agassiz. – Cottreau: 131-135; fig. 40, pl. 3, fig. 1-9; pl. 4, fig. 1-6
	1915a	*Scutella paulensis* Agassiz. – Lambert: 214
v non	1915	*Scutella paulensis* Ag. – Vadász: 121, fig. 17
? non	1953	*Scutella paulensis* Agassiz, 1841. – Szörényi: 65-66; pl. 1, figs. 1-3, 3a-b; pl. 2, fig. 2 [see above under *P. gibbercula*]
v.	1959	*Scutella* B. – Schaffer: 255
#v.	1962	*Scutella media* n. sp. – Schaffer: 151-153; fig. 1; pl. 17, figs. 2-3
	1974	*Scutella paulensis* Ag. – Roman: 331-338
	1978	*S.*[*cutella*] *media* Schaffer, 1962 – Kier & Lawson: 67
	1984	*Scutella paulensis* Agassiz, 1841 – Negretti: 103-105, pl. 4, figs. 4-6; pl. 5. figs. 1-3
	1989	*Parascutella paulensis* – Philippe: 29; tab. 1
	1990	*Parascutella paulensis* (Agassiz, 1841) – Philippe et al.: 243

pp 1998 *Parascutella paulensis* (Agassiz, 1841) – Phillippe: 129-141; figs. 6-11; pl. 13, figs. 1-8, 11; pl. 14, figs. 1-3
non 1998 *Parascutella paulensis* (Agassiz, 1841) – Phillippe: pl. 13, figs. 9-10
v. 2002a *Parascutella paulensis* (Agassiz, 1841) – Kroh: 306-308; pl. 1, figs. 1-5
2003b *Parascutella paulensis* (Agassiz, 1841) – Kroh: 250

Type-material:
Scutella paulensis Agassiz, 1841:
Holotype: a cast of the holotype is located in the collection of the Muséum d'histoire naturelle de Neuchâtel under the number MNS 281 according to Philippe (1998: 307)
Locus typicus: St. Paul-trois-Châteaux, Rhône Basin, France
Age: Burdigalian, Early Miocene

Scutella media Schaffer, 1962:
Holotype: specimen NHMW 1861.L.137; Naturhistorisches Museum Wien, Geologische Abteilung
Locus typicus: Niederkreuzstetten, NÖ
Stratum typicum: Korneuburg Fm.
Age: Karpatian, Late Burdigalian

Material:
Late Eggenburgian (Early Burdigalian) – Limberg (Zogelsdorf Fm., Hengl quarry), NÖ, Austria
NHMW: 1 specimen (NHMW 1998z0048/0050)
Karpatian (Late Burdigalian) – Neubau, near Niederkreuzstetten, NÖ, Austria
NHMW: 3 specimens [NHMW 1861.L.137 (**holotype** of *Scutella media* Schaffer, 1962), 1999z0097/0001, 2004z0077/0001] and 18 fragments (NHMW 1861.L.138, 1981/55/2)
Karpatian (Late Burdigalian) – Niederkreuzstetten (railway crossing 400 m north of the village), NÖ, Austria
NHMW: 2 specimens (NHMW 1999z0097/0001, 2004z0077/0001)

Dimensions (in mm)**:**

Inv. No.	TL	TW	TH	Remarks
1861.L.137	113.2	129.6	~10-12	deformed
1999z0097/0001	118.7	128.5	>12	collapsed
1998z0048/0050	86.9	> 82	10.7	fragmented
2004z0077/0001	118.8	121.2	~11.5	

Description:
Size and shape: Test large, subcircular, slightly transversely elongated. The anterior margin is rounded with very shallow indentations corresponding to the ad-, inter- and perradial sutures (usually much less distinct than in *Ps. gibbercula*). Posterior margin trapezoidal, rounded to transversely truncated with two strong indentations corresponding to the perradial sutures of ambulacra I and V. Anal notch extremely shallow, if present at all. The maximum width lies posterior of the apical disc. In profile, the test is low, with convex aboral and flat oral surface. The maximum height lies approximately at the posterior end of the apical disc. The test width is about 105 to 115 % of TL, the height about 10 %.
Apical disc: The apical disc lies centrally and is tetrabasal with 4 rounded gonopores. The madreporite is pentagonal and crowded by many small madreporic pores.
Ambulacra: The ambulacra are petaloid. The petals are straight, closing distally and are flush with the interambulacra. They extend about two third of the corresponding test radius. The anterior petals are shorter than the posterior ones. The frontal petal is the shortest and is slightly wider than the paired ones. Within the petals the ambulacral pores are septate conjugated isopores (see above under *Ps. gibbercula*), outside the petals only minute microunipores are found. Each poriferous zone is about one and a half times as wide as the interporiferous zone.
Interambulacra: The interambulacra are covered by small, crenulate, perforate tubercles, which are slightly larger adorally than adapically.
Food grooves: The food grooves are restricted to the oral surface, they are simple and bifurcate at about one fifth of the corresponding test radius from the peristome. From this point on they run along the midline of each ambulacral plate row. Just before they reach the ambitus, they bend in direction of the interambulacra.
Peristome: The peristome is subcircular and about up to 4 mm in diameter. It is situated centrally on the oral surface.
Periproct: The periproct is small, rounded to oval (trans-versely elongated) with a diameter of 2 to 2.5 mm. It lies marginally along the interradial suture of interambulacrum 5 between the 3rd pair of postbasicoronal plates.

Differential diagnosis:
The type species of *Parascutella*, *Ps. leognanensis* (Lambert, 1903) from the Early Miocene of Western France, differs from *Ps. paulensis* by its more strongly developed marginal indentations, a prominent anal notch, and its straight, transversely truncated posterior margin [compare Agassiz, 1841a (under the name *Scutella subrotunda*) and Durham, 1953].

Parascutella gibbercula (de Serres, 1829), from the Late Badenian (Early Serravallian) of the Central Paratethys and the Serravallian to Tortonian of the Mediterranean, likewise differs from *Ps. paulensis* by its more strongly developed marginal indentations, its straight, transversely truncated posterior margin with distinct anal notch, its posteriorly eccentric maximum height, the wedge-shaped profile with strong inflation in adapical interambulacrum 5 and the smaller interporiferous zones [the latter feature, however, may be strongly influenced by the preservation of the material, see Schaffer (1962: 136)].

Parmulechinus hoebarthi (Kühn, 1936) from the Early Eggenburgian (Early Burdigalian) differs from *Parascutella paulensis* by its shorter petals (*c*. half the length of the corresponding test radius), its antero-posteriorly elongated outline, its strong anal notch, and the different position of its peristome (between the 4th or 5th pair of postbasicoronal plates).

For the difference between *Ps. paulensis* and *Ps. jaquemeti* (de Loriol, 1902), *Ps. striatula* (de Serres, 1829), *Ps. michaleti* (Lambert, 1906) [Durham (1955: 153) placed this species in *Parmulechinus*, but Philippe (1998) refers it to the genus *Parascutella*; until the oral plating is investigated, however, this question cannot be answered], *Ps. depereti* (Lambert, 1912), and *Ps. savini* (Lambert, 1915) the reader is referred to Philippe (1998).

Discussion:
Because of the marginal position of the periproct between the 3rd pair of postbasicoronal plates and the long petals (two third of the corresponding test radius), the specimens studied are placed into the genus *Parascutella* Durham, 1953. Based on the high similarities of test features Kroh (2002a: 306-307) placed the species *Scutella media* Schaffer, 1962 into the synonymy of *Ps. paulensis* (Agassiz, 1841). According to Cottreau (1913a: 53) and Philippe (1998: 129-133) *S. lorioli* Lambert 1906 and *S. deydieri* Lambert, 1912 are also junior synonyms of *Ps. paulensis*.

Philippe (1998: 129-141) attributed a number of specimens (e.g. the specimens on pl. 13, figs. 9-10) from the Serravallian of Southern France to *Ps. paulensis* which show a number of differences to the Burdigalian material of *Ps. paulensis* (compare Cottreau, 1913a: pls. 3, figs. 1-9 and pl. 4, figs. 1-6). These specimens are more similar to *Ps. gibbercula* as they show a distinct anal notch, more prominent marginal indentations, and a wedge-shaped profile. The attribution of these specimens to *Ps. paulensis* seems to be questionable.

Occurrence:

Austria: Late Eggenburgian (Early Burdigalian), Karpatian (Late Burdigalian)
- Molasse Zone: Limberg (Zogelsdorf Fm., Hengl quarry), NÖ [NHMW]
- Vienna Basin: Niederkreuzstetten, NÖ, Austria (pp Laube, 1871); Neubau, near Niederkreuzstetten, NÖ, Austria (Schaffer, 1959, 1962; Kroh, 2002a, 2003b; [NHMW])

Mediterranean: Aquitanian-Burdigalian, ? Langhian, ? Serravallian
- Rhône Basin: Aquitanian: Carry-le-Rouet (Nerthe), Sausset-les-Pins (Nerthe); all in France (Roman, 1974; Negretti, 1984; Philippe et al., 1990; Philippe, 1998)
- Burdigalian: Istres, Manosque, Montpezat, Juvignac, Beaucaire, Buoux, Céreste, Ménerbes, Montjustin, Saigon, Saint-Martin-de-Vastillon, Reillanne, Viens, Bllène, Clansayes, Grignan, Montbrison-sur-le-Lez, Saint-Paul-Trois-Châteaux, Saint-Restitut, Solérieux, Suez-la-Rousse, Taulignan, Autichamp, Crest, Divajeu, Bouvante (Vercors); all in France (Lambert, 1912; Cottreau, 1913a; Roman, 1974; Philippe, 1998)
- ? Langhian: Châteauneuf-Miravail, France (Philippe, 1998)
- ? Serravallian: Istres; Lambesc, Rognes, Salon-de-Provence, Ansouis, Cadenet, Curcuron, la Motte-d'Aigues, Sannes, Mérindol-les-Oliviers, Puyméras; all in France (Philippe, 1998)

Parascutella ? sp.

	1877	*Scutella* – Fuchs: 667
	1877	*Scutella* – Karrer: 262
	1894	*Scutella* (*subrotunda* Lam?) – Lörenthey: 59
	1908	*Scutella* – Schaffer: 36
	1924	*Scutella* – Abel: 60
	1924b	*Scutella* – Schaffer: 485
	1927a	*Scutella* – Schaffer: 78
	1943	*Scutella* – Janoschek in Schaffer: 445
	1951	*Scutella* – Janoschek in Schaffer: 563
	1961	*Scutella* –Schaffer: 149
	1961	*Scutella* – Wessely: 319
	1965	Scutellen – Fuchs: 169
	1968	*Scutella* sp. – Schmid: Anhang
	1974	*Scutella* – Thenius: 69
	1978b	*Scutella* – Papp et al.: 33
	1983	*Scutella* – Dullo: 19
	1985	*Scutella* – Tollmann: 501
	1987	*Scutella* (?*Parascutella*) sp. – Mączyńska: 146-148; pl. 3, fig. 8
pp	1987	*Echinolampas* sp. – Mączyńska: 147, 149; pl. 4, fig. 5
?	1991	*Scutella* sp. – Roetzel et al.: 48
	1991b	*Parascutella* – Nebelsick et al.: 119
v.	2002b	*Parascutella* sp. – Kroh: 12
	2004	*Scutella* – Radwański & Wysocka: 384

Material:

Early Badenian (Langhian) – Gainfarn, NÖ, Austria
- NHMW: 2 fragments (NHMW 2004z0076/0066-67)
- Neitz coll.: 1 fragment (no inventory number)

Badenian (Langhian-Serravallian) – Neckenmarkt, Burgenland, Austria
- NHMW: 5 fragments (NHMW 2004z0001/0057)

Discussion:

A number of literature records of the genus "*Scutella*" from the Neogene of the Central Paratethys could not be referred to any of the species mentioned above. In most cases the records lack any description and/or illustrations or are based on highly fragmentary material precluding identification to species level. The material is here referred to the genus *Parascutella* as the "true" *Scutella* (emend. Durham, 1953) was never recorded, nor were any specimens referable to that genus recovered during the preparation of the present paper. As observed already by Ali (1998: 543) it seems highly probable that *Scutella* never reached the Paratethys. It is also lacking from all well documented fauna from the northern coast of the Mediterranean [e.g. the Rhône Basin (see Philippe, 1998)].

The "*Echinolampas* sp." fragment from the Korytnica Clays figured by Mączyńska (1987: pl. 4, fig. 5) is most certainly a scutellid fragment. This can be concluded by the presence of elongated conjugate anisopores, which are typical for scutelline echinoids and the small diameter of the tubercles, which is much larger in echinolampadids.

Occurrence:

Austria: ? Egerian (Chattian-Aquitanian), Late Eggenburgian (Early Burdigalian), Badenian (Langhian-Early Serravallian)
- Molasse Zone: Limberg (Hengl quarry), NÖ (Nebelsick et al., 1991b); ? Steyregg (sandpit Treul), OÖ (Roetzel et al., 1991)
- Vienna Basin: Gainfarn, NÖ (Kroh, 2002b); Hainburg Mts. (Wessely, 1961); Mannersdorf, NÖ (Schaffer, 1908); Mödling (Karrer, 1877); Müllendorf, Bgld (Schaffer, 1961; Dullo, 1983); Rauch-stallbrunngraben, near Baden, NÖ (Abel, 1924); Vienna Basin (Fuchs, 1877; Schaffer, 1924b, 1927a; Thenius, 1974)
- Eisenstadt-Sopron Basin: Leitha Mountains (Janoschek in Schaffer, 1943, 1951; Tollmann, 1985); Oslip, Bgld (Fuchs, 1965; Dullo, 1983)
- Danube Basin: Donnerskirchen, Bgld (Schmid, 1968)
- Oberpullendorf Bay: Neckenmarkt, Bgld ([NHMW])

Paratethys (non-Austrian occurrences): Early Badenian (Langhian)
- Fore-Carpathian Basin: Korytnica Clays, Poland (Mączyńska, 1987); Świniary, Poland (Radwański & Wysocka, 2004)
- Transylvanian Basin: Rachiş (= Oláh-Rákos), Romania (Lörenthey, 1894)

Genus *Parmulechinus* Lambert, 1906d

= *Stenaster* Lambert, 1905 non *Stenaster* Billings, 1885 (see Hotchkiss, 1976 for further information on the latter)

Type-species: *Stenaster labriei* Lambert, 1905 = *Scutella striatula* Agassiz, 1841 non de Serres, 1829; by original designation (Lambert, 1910c: 63). *Stenaster labriei* was considered a junior synonym of *Scutella agassizi* Oppenheim, 1902 by Lambert (1915b: 19-29)

Diagnosis: Medium-sized to large, thin test; petals small, about 50 % of corresponding test radius. Ambitus broadly indented at the ambulacra. Six to seven ambulacral and four to five interambulacral coronal plates on oral surface. Interambulacra about half as wide as the ambulacra at the ambitus. Periproct marginal to submarginal, between the 4th or 5th pair of postbasicoronal plates (modified from Durham, 1953, 1955 and 1966).

Distribution: Oligocene to Early Miocene – Europe (Durham, 1966)

Parmulechinus hoebarthi (Kühn, 1936)

(Figs. 38-41; Pl. 44, Fig. 2; Pl. 45, Figs. 1-7; Pl. 46, Figs. 1-4)

*v.	1936	*Scutella höbarthi* nov. spec. – Kühn: 40-43; figs. 2-3; pl. 1, figs. 1-3
v.	1936	Jugendform?. – Kühn: 43; pl. 1, figs. 4
v.	1959	*Scutella* A (=*höbarthi* Kühn). – Schaffer: 255

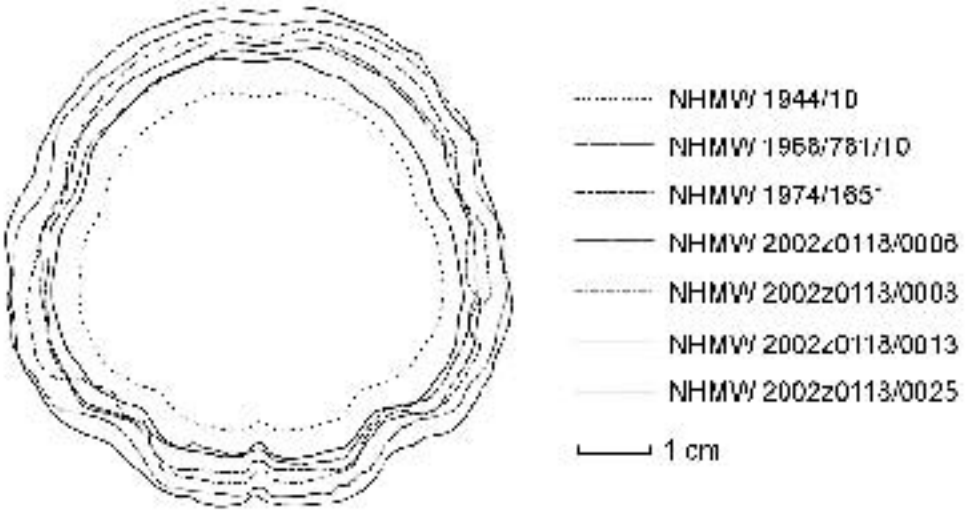

Figure 38: Variation in outline in *Parmulechinus hoebarthi* (Kühn, 1936).

v. 1962 *Scutella höbarthi* Kuehn – Papp & Thenius in Kühn: 433
v. 1962 *Scutella höbarthi* Kühn – Schaffer: 151; pl. 17, fig. 1
v. 1971a *Scutella höbarthi* Kühn, 1936 – Steininger: 595; pl. 2, fig.1-2
. 1971b *Scutella höbarthi* Kühn – Steininger: 119
1971e *Scutella hoebarthi* Kühn – Steininger: 167
. 1974 *Scutella höbarthi* Kühn – Thenius: 47
v. 1978 *S.[cutella] hobarthi* Kühn, 1936 – Kier & Lawson: 67
v. 1991 *Parascutella höbarthi* – Nebelsick: 75-79
v. 1998 *"Scutella " hoebarthi* – Schultz: 118; pl. 53, fig. 1
v. 1999 *Parascutella höbarthi* – Nebelsick: 351-352; fig. 4B-D, fig. 5B, D
v. 2002 *Parascutella höbarthi* – Nebelsick & Kroh: 380-381; tab. 2

Type-material:
Holotype: specimen figured by Kühn,1936: 40-43; pl. 1, fig. 1; housed at the Höbarth-Museum, Horn, NÖ under the inventory number 577 together with two other adult and 4 juvenile specimens of the same species
Locus typicus: Eichberg (= Achberg) east of Horn, near Maria Dreieichen, NÖ
Stratum typicum: "Scutellensand", Loibersdorf Fm.
Age: Early Eggenburgian (Early Burdigalian), Early Miocene

Material:
Early Eggenburgian (Early Burdigalian) – Eichberg near Maria Dreieichen, NÖ, Austria
NHMW: 72 specimens [NHMW 1321/69/1-5, 134/19551-2, 1935(No.69)/1/94-97 (**figured specimens** of Kühn, 1936), 1935/80/1-6, 1944/10, 1968/781/1-11, 1972/1546/1-8, 1974/1651, 1997z0178/0492 (5 specimens), 1998z0048/0058, 2002z0118/0001-27]
Höbarth Museum: 3 adult and 4 juvenile specimens [No. 577 (among those specimens is the **holotype** of *S. hoebarthi*)]
Krahuletz Museum: 8 specimens (without inventory numbers)
IPUW: 1 juvenile specimen (IPUW 1992/195b), 26 adult specimens (IPUW no inventory nos.)
Nebelsick coll.: 35 specimens (without inventory numbers)

Dimensions (in mm)**:**

Inv. No.	TL	TW	TH
Holotype (HM 577/1)	63.6	69.6	~9.2
HM 577/2	61.9	64.5	~9.8
HM 577/3	59.2	59.6	7.9
NHMW 1944/10	45.0	48.7	6.0
NHMW 1972/1546/7	48.4	50.2	7.5
NHMW 2002z0118/0013	52.9	54.8	7.0
NHMW 1974/1651	56.4	58.5	8.0
NHMW 1968/781/7	56.4	54.9	7.8
NHMW 2002z0118/0008	60.1	61.0	7.3
NHMW 1972/1546/5	62.4	63.3	8.1
NHMW 2002z0118/0006	62.9	67.1	9.4
NHMW 2002z0118/0004	63.1	65.8	6.8
NHMW 1968/781/1	64.5	64.3	8.8
NHMW 1955/1	66.2	66.8	8.5
NHMW 2002z0118/0014	68.9	69.4	9.5

Description:
Size and shape: The test is of medium size, ranging from 43 to 74 mm TL in the studied material (apart from two juvenile specimens measuring 5.2 respectively 8.6 mm). The outline of the test is subcircular to trapezoidal with distinct indentations in the ambulacra. The indentations are strongest in ambulacra I and V (Fig. 38). Additionally, there is a distinct, narrow anal notch. The aboral surface is slightly concave, the oral surface flat. The maximum height coincides with the apical disc. The test width ranges from 92 to 114 % TL (mean = 104 %), the height from 10 to 18 % TL (mean = 14.2 %).
Apical disc: The apical disc is tetrabasal and lies centrally on the aboral side [distance to the anterior margin ranges from 45 to 51 % TL (mean = 48 %)]. The madreporite is pentagonal and crowded with numerous small madreporic pores. Four gonopores lie at the apices of the madreporite, except in interambulacrum 5.
Ambulacra: The ambulacra are petaloid. The petals are more or less of equal length, only in some specimens the posterior paired petals may be up to 10 % longer than the others. The petals extend about 50 % of the corresponding test radius, only the posterior paired petals are slight longer (mean of 53 % TL). The petals are straight, open and have a lanceolate shape. They consist of closely spaced conjugate anisopores. The frontal petal is more widely open than the paired petals. The poriferous zones are very slightly depressed and each about 0.5 to