

**Insectivora and Anigalida from the Chijiang
Basin of Jiangxi Province**

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Introduction

The text describes Insectivora and Anagalida from the Late Paleocene Chijiang Basin of Jiangxi Province. The collections are small, but represented are an unidentified insectivore and two new species of Anagalida assigned to the genera *Hsiuannania* and *Pseudictops*.

Insectivora gen. et sp. indet.

(Plate I, Figures 1,2; Text Figures 1,2)

Material: A pair of incomplete mandibles. Left mandible preserves the last two molars (V5032)*, while the right mandible preserves only the last molar with a damaged talonid (V5032.1).

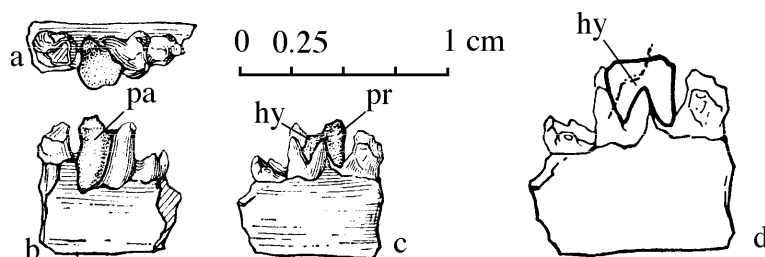


Figure 1. Insectivora, gen. et sp. indet. a. Occlusal view. b. Labial view. c. Lingual view. d. Position of hypocone prior to being prepared as represented by dashed line.

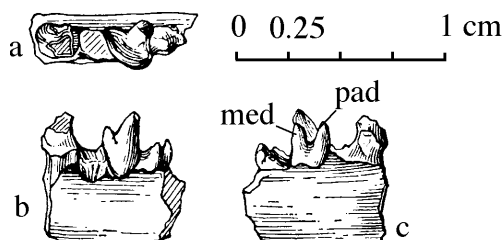


Figure 2. Left mandible of Insectivora, gen. et sp. indet. a. Occlusal view. b. Labial view. c. Lingual view.

Locality and stratigraphic position: Late Paleocene Lannikeng Mem. of Chijiang Fm., one-half km southwest of Zhulinshan, Dayu Co., Jiangxi Province.

Description and comparison: Three upper molar tooth cusps preserved in one of the Jiangxi specimens include a protocone, paracone, and hypocone, which are all equivalent in size and very acute. The hypocone is only slightly shorter than the protocone and is positioned directly lingual to it.

* The left mandible is preserved with cusps of the third upper molar in occlusion (Pl. I, Figs. 1a-d; Txt. Fig. 1a-c) which were prepared away in order to study the lower tooth. From a lingual perspective there is a relatively large cusp in the talonid of the second lower molar which should represent the protocone of the opposing upper molar (Pl. I, Fig. 1a; Txt. Fig. 1c). Posterior to this and linked to the protocone is another cusp inserted into the trigonid of the next posterior tooth and which should represent the hypocone of the same upper molar (Pl. I, Fig. 1a, Txt. Figs. c-d.). From a labial perspective, there is a cusp appressed against the protoconid of the third molar which preserves enamel at its apex, and which should represent the paracone of the upper molar (Pl. I, Fig. 1c; Txt. Fig. 1b).

On the mandible, the anterior margin of the coronoid process is perpendicular to the ramus and the masseteric fossa is deep. Lower molars are high crowned with high trigonids and lower talonids (trigonid length 1.5 mm, width, 1.8 mm). The protoconid is the highest cusp with a projected labial wall and flat and smooth lingual wall. The metaconid is approximately two-thirds the height of the protoconid, whereas the paraconid is nearly equivalent in height to the metaconid, is situated lingually, and connects to the metaconid half-way up its lingual side. The prevallid is slightly oblique, the postvallid is transverse, the talonid is extremely low, narrow, and long (length 1.9 mm, width 1.1 mm), and the hypoconulid, which is situated in the center of the talonid basin's posterior margin, is the highest cusp on the talonid. The entoconid and hypoconid are equivalent in size and situated at the center of the lingual and labial margins of the talonid. Cingula are absent lingually, labially, and posteriorly, but a weak anterior cingulum is present.

The Chijiang specimens maintain the tribosphenic morphology with acute cusps which is typical of the Insectivora. The trigonid is not distinctly compressed anteroposteriorly, and the low, narrow and long talonid with three distinct cusps easily distinguish the specimens from contemporaneous primitive mammals such as primates, anagalids, or condylarths.

The Jiangxi specimens differ from the Asian *Sarcodon* and *Hyracolestes* in that among the upper molar cusps preserved, the hypocone is much larger than that on the M1 of *Sarcodon*, it is distant from the protocone but in direct alignment to it. The size and position of the hypocone suggests the lingual margin of this molar is square, which is also distinct from the M1 of *Sarcodon* and even more distinct from the M2 of *Sarcodon*. Furthermore, the m3 paraconid on the Jiangxi specimen is much larger and positioned more posteriorly than on both *Sarcodon* and *Hyracolestes* and consequently, the trigonids of the Jiangxi specimens are lingually more reduced than the former genera. The Jiangxi specimens also possess a distinct entoconid which differs from *Hyracolestes*. The m3 of the Jiangxi specimen differs from the m2 of *Sarcodon* in its narrow and long talonid, entoconid and hypoconulid relatively distant, and the contact of the cristid obliqua with the trigonid is positioned relatively lingually, while on the latter the talonid is relatively broad, entoconid and hypoconulid are relatively close, and the cristid obliqua contact is more labial. Hence, the Jiangxi specimens are morphologically distinct from both *Sarcodon* and *Hyracolestes*.

Characters uniting the Jiangxi specimen with the leptictid genera *Diaphyodectes* and *Leptonysson* include a large hypocone, lingually compressed trigonid, lingually positioned paraconid, long and narrow talonid with three distinct cusps, and an entoconid distant from the hypoconulid. But detailed comparisons cannot be conducted due to the restricted data at hand. Nevertheless, upper molar characters suggest the Jiangxi specimens very possibly represent a new Asian genus.

Anagalida Szalay and Mckenna, 1971

Anagalidae Simpson, 1931

***Hsiuannania* Xu, 1976**

***Hsuiannania minor* sp. nov.**

(Plate I, Figure 3)

Material: A fragmentary right mandible with m1-2 (V5034), an isolated m3 and ?p4 (V5034.1).

Locality and stratigraphic position: Upper Paleocene, Lannikeng Mem. of the Chijiang Fm. Specimen V5034 was produced from the village of Niuelong, Qinglong Commune (field loc. #73055). Specimen V5034.1 was produced from 100 m west of Zhulinshan, Qinglong Commune, both in Dayu Co., Jiangxi Province.

Diagnosis: Compared to *H. tabienensis* from the lower member of the Doumu Fm., Qianshan Co., Anwei Province, the new material is slightly smaller, with more gracile molars, a more planar occlusal surface, and a talonid that is longer than trigonid, particularly on the m1.

Description and comparison:

(1) Niulong specimen: The m1 and its cusps are preserved only in outline as the enamel is nearly entirely missing. The trigonid resembles a long ellipse, the talonid is basined and much broader than the trigonid, and the hypoconulid is posteriorly directed and relatively compressed, unlike the rounded hypoconulid on *H. tabienensis* (m1 length 4 mm, trigonid breadth 3 mm, talonid breadth 2.9 mm).

The m2 is slightly larger than the m3 and is also missing nearly all its enamel. The tooth is broad, nearly square with a relatively long lingual trigonid, and a talonid that is slightly longer than the trigonid. Labially, the remnant enamel penetrates deeply into the dental trough, which resembles *H. tabienensis* only the Niulong trigonid is slightly longer and overall the tooth is slightly smaller (m2 length 4.2 mm, trigonid breadth 3.5 mm, talonid breadth 3.8 mm).

(2) Zhulinshan specimens: Preservation of these two isolated teeth is extremely poor as the enamel on the lower premolar is nearly completely missing. But from the outline and size it may be determined to be a lower fourth premolar. The second specimen is a right lower m3 with a damaged lingual side but relatively well preserved labial side. Cusps are worn flat due to heavy occlusal wear. The talonid is much longer than the trigonid, and from an anterior perspective its hypsodonty is distinct. It is difficult to compare these specimens to other taxa due to their fragmentary nature, although from the specimens' size and degree of hypsodonty they appear to resemble the previously described new taxon *H. minor*.

Pseudictopidae Sulimski, 1968

***Pseudictops* Matthew, Granger and Simpson, 1929**

cf. *Pseudictops tenuis* sp. nov.

(Plate I, Figures 4,5)

Material: Two fragmentary mandibles from the same individual, the right with p4-m3 (V5033) and left with p3-m2 (V5033.1).

Locality and stratigraphic position: Late Paleocene Lannikeng Member of the Chijiang Fm. Approximately 200 m south of Lingbei, Chijiang Commune, Dayu Co., Jiangxi Province.

Diagnosis: The ramus is flat and slender with a brachydont, narrow, and small dentition. The p4 is not highly molariform, p4-m2 trigonids are anteroposteriorly compressed, talonids are relatively long with a projected lingual margin and a particularly well developed entoconid. The p4 is slightly smaller than the m1.

Description: Ramus is flat, slender, and recurved. It distinctly attenuates anteriorly and is lingually directed from the point of the p3. A mental foramen is absent on the ramus until below the p2.

The dentition is narrow, small, and brachydont. The p3 has a long trigonid and a short and low basin-shaped talonid bearing a hypoconid, entoconid and hypoflexid. The p4 is larger than the p3, is not highly molariform and possesses a high anteroposteriorly compressed trigonid. The

metaconid is conical and paraconid is low with a well developed paralophid. The talonid is low and basin shaped with a well developed cristid obliqua, hypoconid, and entoconid. A hypoconulid and hypoflexid are present and there is a well developed anterior cingulum. The m1 is slightly larger than the p4 with a high trigonid that is narrow and v-shaped. In its worn condition, the metaconid is slightly higher than the protoconid, while the paraconid is small, low, and situated lingually. The talonid is broader than that on the p4 with a well developed hypoconid. The entoconid and hypoconulid are distinctly enlarged and deep grooves separate the three cusps. The hypoflexid is deep and an anterior cingulum is well developed. The m2 is larger than the m3 and is morphologically similar to the m1.

Comparison and discussion: Specimen V5033 resembles *Pseudictops lophiodon* in its lophate dentition, high trigonid that is distinctly anteroposteriorly compressed and is narrow and v-shaped, its high protoconid and metaconid, low and small paraconid that is lingually placed, and a relatively low, broad, and short talonid with a well developed hypoconid, entoconid and hypoconulid.

The specimens differ from *P. lophiodon* in the following characters:

1. Although depth of rami are similar V5033 is distinctly more slender or gracile.
2. V5033 projects lingually at the p3 which is unlike *P. lophiodon*.
3. A mental foramen is not present up until the p2 on V5033 and consequently, its position is further anterior, whereas this foramen on *P. lophiodon* lies between the p2-3.
4. V5033 is slightly more brachydont than *P. lophiodon*. Although the stage of wear differs between both and it is difficult to compare hypsodonty indexes, nevertheless, hypsodonty data derived from text figures are presented in Table 3 and indicate that V5033 is still more brachydont than the most worn *P. lophiodon*.
5. V5033 molars are much smaller than *P. lophiodon* (Table 3).
6. The V5033 p4 is smaller than the m1, as opposed to on *P. lophiodon* where the p4 is slightly larger than m1.
7. The Jiangxi specimen and *P. lophiodon* differ in talonid morphology as the former is slightly longer (Table 5) and has a more well developed entoconid, in addition to displaying deep grooves which separate the tooth cusps.

Further distinctions between the two include a more well developed p3 hypoconid on V5033 in addition to a p4 which is slightly less molariform and possesses a conical protoconid and metaconid, a paralophid that is gently lingually extended, and a well developed anterior cingulum. The *P. lophiodon* paralophid is precipitous and straight and its anterior cingulum is extremely weak. V5033 has a conical metaconid on the m1-2 which is indistinct on *P. lophiodon*. All these characters define the Jiangxi specimen as distinct from the latter species and it is hereby designated cf. *Pseudictops tenuis*. It is believed to be more primitive than *P. lophiodon* because of its relative brachydonty and low degree of p4 molarization. Species nomenclature relates to its gracile nature.

Furthermore, characters suggesting that it may not be a species of *Pseudictops* include the slender mandible, brachydonty, p4 slightly smaller than m1, relative low degree of p4 molarization, extremely large entoconid on molars, and a conical metaconid. It is provisionally placed in this genus, however, due to restricted data at present.

Table 1. Comparison of cf. *P. tenuis* and *P. lophiodon* mandibles (mm).

		p2 mand. height	m3 mand. height	p2 mand. width	m1 mand. width	m3 mand. width
cf. <i>P. tenuis</i>	L		11.8		5.7	5.7
	R	8.7	11.8	4.3	5.7	6.1
<i>P. lophiodon</i>		13.6-16.0	12.5, 13.0-15.0		6.5, 7.0 6.4-8.0	6.0, 7.5 7.0-8.5

Table 2. cf. *P. lophiodon* dental measurements (mm).

	p3		p4		m1		m2		p2-m2 Length
	L	W	L	W	L	W	L	W	
Left	3.7		4.1	3.2	4.1	3.5	4.1	3.8	16.0
Right			4.1	3.4	4.1	3.2	4.2	3.6	16.5

Table 3. Comparison of cf. *P. tenuis* and *P. lophiodon* hypsodonty (mm).

	<i>P. lophiodon</i>				cf <i>P. tenuis</i>		
	#21727	Z. Pal. #Mgm-II/15	Z. Pal. #Mgm-II/24	V5033.1			
	Lingual	Lingual	Labial	Lingual	Labial	Lingual	Labial
p4	4.8	4.4	6.0	3.9	5.2	3.3	3.3
m1	3.6	4.7	5.2	2.5	3.6	3.3	2.9
m2	5.3	6.0	6.0	3.4	4.1	3.5	3.4

Table 4. Comparison of cf. *P. tenuis* and *P. lophiodon* dental wear.

<i>P. lophiodon</i>			cf <i>P. tenuis</i>
#21727	Z. Pal. #Mgm-II/15	Z. Pal. #Mgm-II/24	V5033.1
Slightly shallower than cf. <i>P. tenuis</i>	Shallow	Deepest	Deep

Table 5. Comparison of cf. *P. tenuis* and *P. lophiodon* length/width index (mm).

	p4	m1	m2
<i>P. lophiodon</i>	1-1.2	1-1.04	0.9-1.1
cf. <i>P. tenuis</i>	1.2	1.2	1.1

Table 5. Comparison of cf. *P. tenuis* and *P. lophiodon* trigonid/talonid index (mm).

	p3	p4	m1	m2
<i>P. lophiodon</i>	1.2-2.05	1.04-2.4	1.0-1.1	0.92-1.17
cf. <i>P. tenuis</i>	2.5	0.95-1.1	0.78-0.86	0.61-0.64

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