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The Indian fruit bat *Latidens salimalii* Thonglongya, 1972 (Chiroptera: Pteropodidae) rediscovered in southern India

Paul J. J. Bates, David L. Harrison, Nikky M. Thomas & Manoj Muni

Abstract. Six specimens of *Latidens salimalii* were collected in April 1993 in the High Wavy Mountains, Tamil Nadu, India. Previously, this species was known only from the holotype which was collected in 1948. A description of the external, cranial, dental and bacular characters is included.

Key words. Mammalia, Megachiroptera, India, taxonomy, *Latidens salimalii*.

Introduction

On 11 June 1948, Angus Hutton collected a fruit bat from the High Wavy Mountains, Madurai District, southern India. Believing it to be *Cynopterus sphinx*, a common species throughout much of the Indian subcontinent, he took only a single specimen and simply noted that it was "the commonest bat in the hills where it is often seen in the evenings, flitting about the edge of the jungle . . ." (Hutton 1949). It was placed in the collection of the Bombay Natural History Society. On 21 November 1970, the specimen was reexamined by Kitty Thonglongya and was found to represent not only a new species but also a new genus endemic to southern India. It was subsequently described and named *Latidens salimalii* Thonglongya, 1972 on account of its broad cheekteeth and in honour of the distinguished Indian ornithologist Dr Salim Ali. No subsequent attempts were made to assess the status of this indigenous bat and until recently it was only known by the holotype, skin and skull, (Corbet & Hill 1992; Mickleburgh et al. 1992).

In April 1993, Mr Manoj Muni of the Bombay Natural History Society and Miss Nikky Thomas of the Harrison Zoological Museum, Sevenoaks, visited the High Wavy Mountains to undertake a preliminary survey of the bat fauna. They collected six specimens of *Latidens salimalii*, which are here described.

Material

All six specimens of *Latidens salimalii* were collected on 8 April at Yeni Kodai Cave which is situated on the Kardama Coffee Estate, Megamalai, Tamil Nadu (approx. 09° 50' N 77° 24' E). The measurements of the specimens, five males and one female, and those of the holotype, thought to be a male, (Thonglongya 1972) are given below (Table 1). Four of the recent specimens have been preserved in spirit, with their skulls extracted; two have been prepared as skins and skulls. Currently, three (MM221/222/223) are held in the collection of the Bombay Natural History Society and three (MM224/225/226) at the Harrison Zoological Museum.

Diagnosis

A medium sized fruit bat comparable in size to *Cynopterus sphinx* (Vahl, 1797) but with no external tail. Muzzle typically Cynopterine with deep emargination between the two projecting nostrils (Plate I). Pelage short and soft; dark brown to black, lightly grizzled with pale hairs between the eyes and on the anterior cheeks; grizzling varies in intensity, being more or less pronounced on the shoulders and throughout the dorsal aspect; there is an indistinct rosette of hairs on the upper shoulder. An infusion of chestnut hairs is present on the posterior back, flanks above the wings and on the elbows and forearms; upper wing virtually devoid of hairs. Hairs present to the edge of the short interfemoral membrane, above and below. Hairs on chest and belly are short; pelage on chin and neck particularly sparse. Wings black throughout; fingers dark above, slightly paler below. Pale buffy hairs present on underside of plagiopatagium, from a line joining knee to outer border of elbow. Ears dark throughout; the tips narrowly rounded. Claws of feet characteristically ivory coloured.

Skull (Plate II) with shortened rostrum, short postorbital processes and without postorbital foramina. Temporal ridges ill defined, usually extend separately as far as lambda. Lambdoid crests well defined. Interorbital and postorbital regions relatively wide; infraorbital and lachrymal foramina large. Palate narrow anteriorly, broad at a level between posterior cheekteeth and with a considerable postdental extension. Thirteen palatal ridges; anterior four are undivided, fifth to twelfth divided and posterior ridge denticulate (Fig. 1). Basioccipital pits well developed. Each half mandible with a relatively slender horizontal ramus; coronoid narrow with tip curved posteriorly.

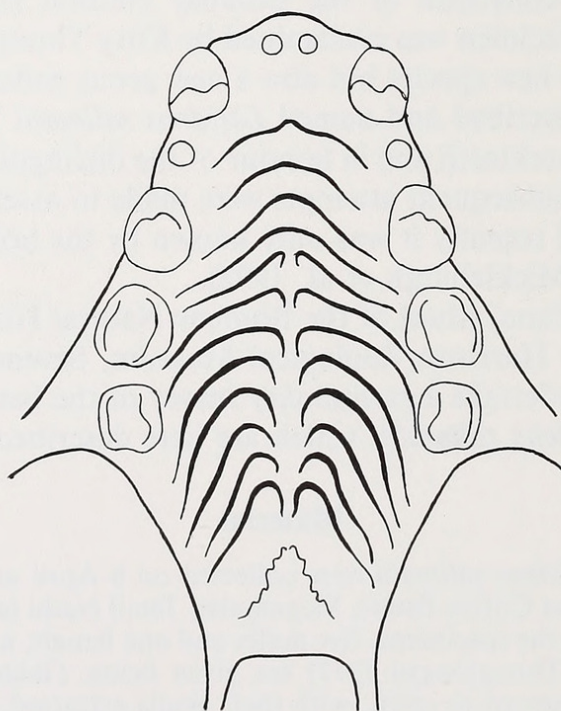


Fig. 1: Palatal ridges of *Latidens salimalii* (MM221). Stereomicroscope drawing by D. L. Harrison.



Plate I: Salim Ali's fruit bat, *Latidens salimalii*. Photograph by N. M. Thomas.

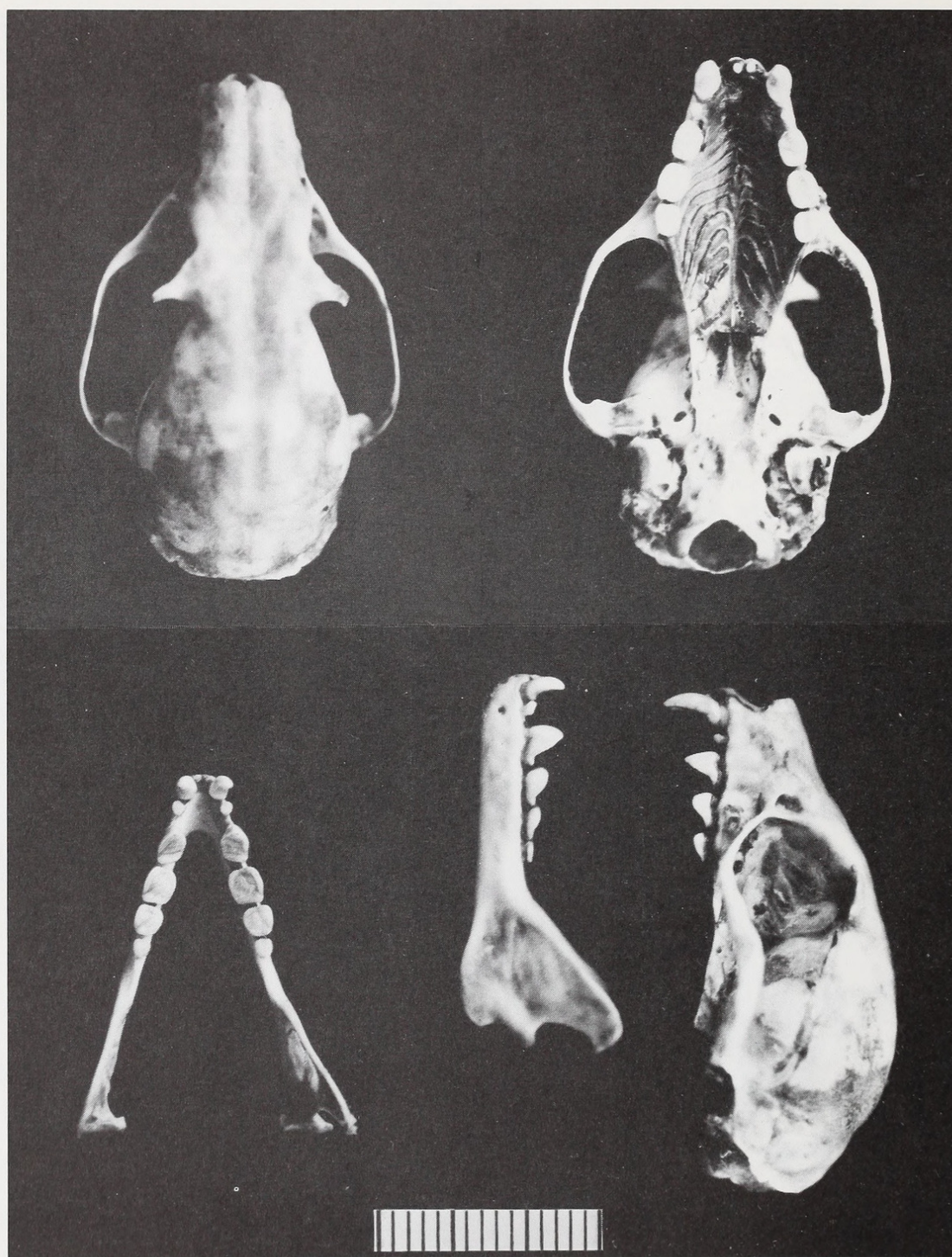


Plate II: Skull of *Latidens salimalii* (MM225). Scale = 15 mm. Photographs by P. J. J. Bates.

Dentition characterised by one pair of upper and lower incisors (Fig. 2). Upper incisor simple and peg-like. Upper canines with faint antero-median groove, but without cingular cusps. Small anterior premolar (PM1) functional; slightly exceeds upper incisor in crown area; situated equidistant from canine and second upper premolar (PM3) (Figs 3 & 4). Upper cheekteeth relatively broad and short in comparison to those of *Cynopterus sphinx*, most noticeable in the third upper premolar

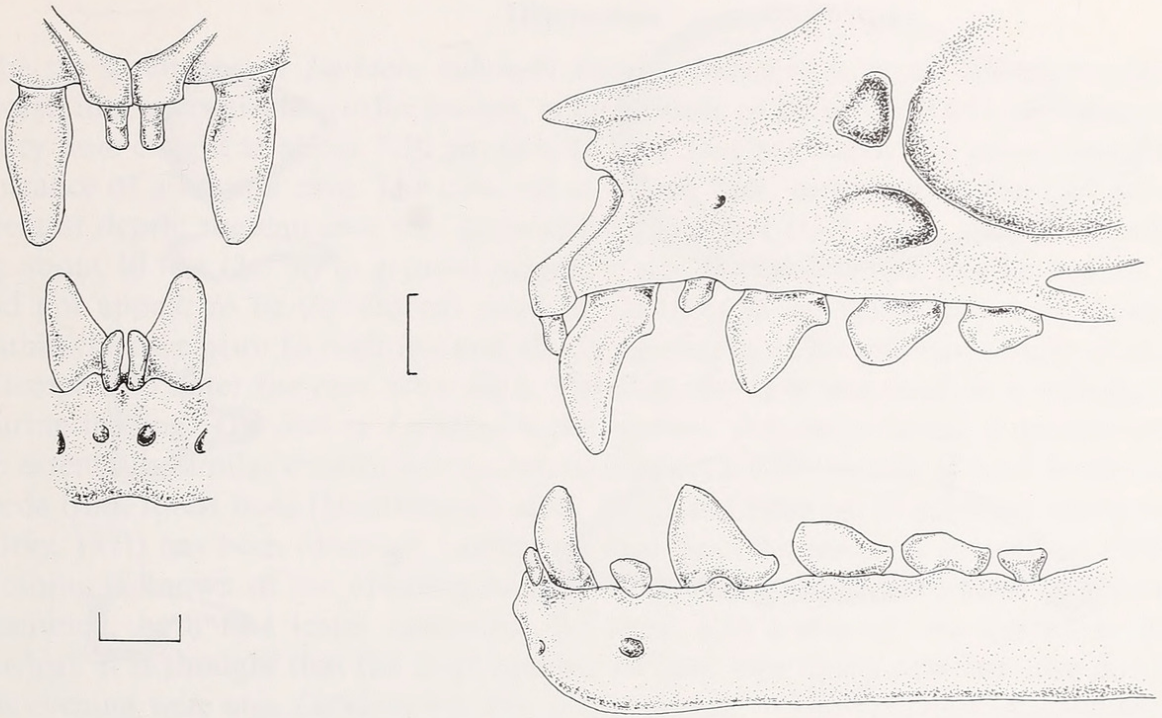


Fig. 2 (left): Anterior dentition of *Latidens salimalii*. Anterior view of upper (MM221) and lower (MM224) incisors and canines.

Fig. 3 (right): Left lateral view of dentition of *Latidens salimalii*. Maxillary and mandibular dentition (MM221).

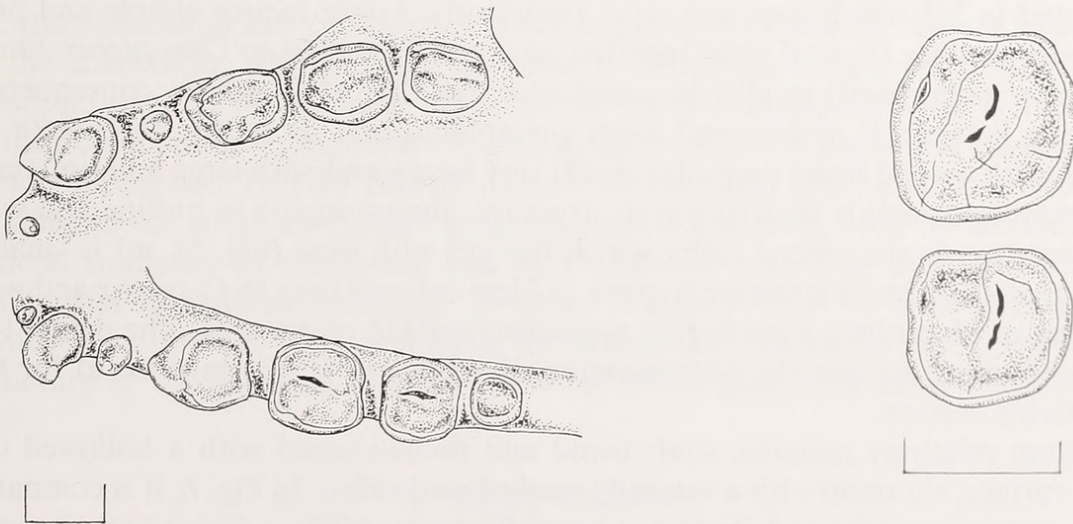


Fig. 4 (left): Occlusal view of left dentition of *Latidens salimalii*. Maxillary (above) and mandibular (below) dentition (MM221).

Fig. 5 (right): Occlusal view of cusps of the left mandibular molars of *Latidens salimalii*. First and second molars (MM224). (Figs 2–5: Scale = 2 mm. Stereomicroscope drawings by D. L. Harrison).

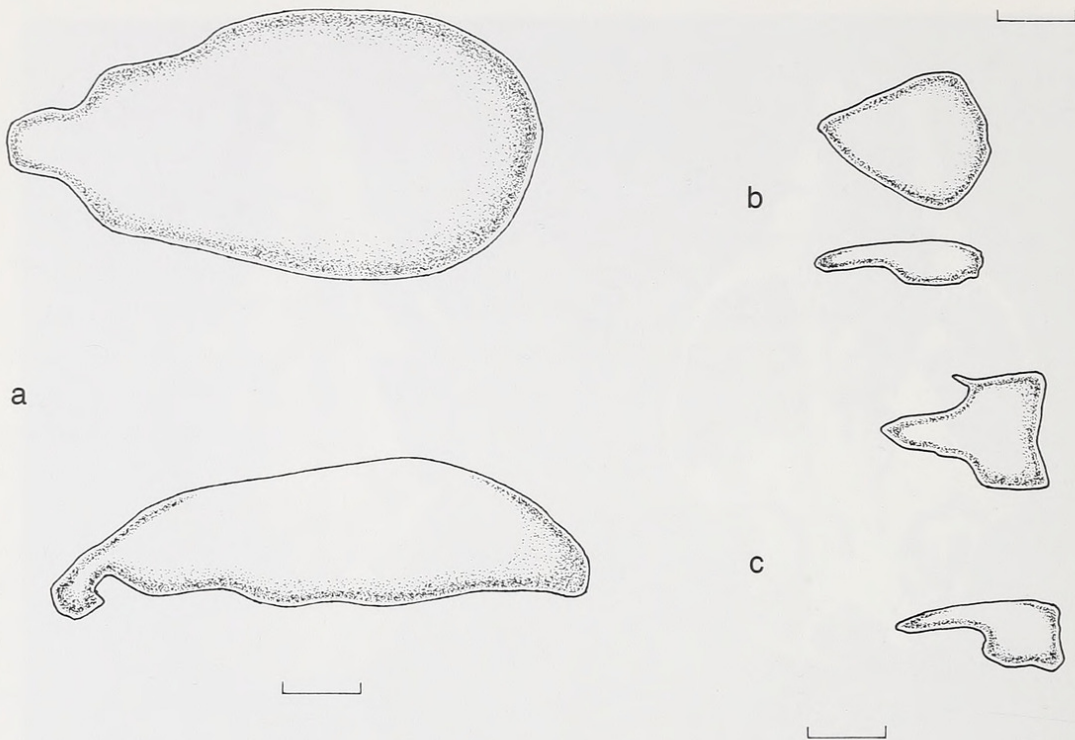


Fig. 6: Bacula of three species of fruit bat; dorsal (above) and lateral (below) views. a: *Latidens salimalii* (MM225). b: *Penthetor lucasi* (HZM.4.7438), Telok Asam, Sarawak. c: *Cynopterus sphinx* (MM.54), Haldwani, UP, India. Scale = 1 mm. Stereomicroscope drawings by N. M. Thomas.

(PM4) and in M1 which does not taper posteriorly. Lower incisor simple and peg-like. Lower canines situated close together, in marked contrast to *Cynopterus*. Small anterior premolar (pm1) smaller in crown area than that of *C. sphinx*, consequently larger gap between it and second lower premolar (pm3). Posterior cheekteeth all massive, with second lower premolar (pm3) very heavy and with large anterior cusp; third premolar (pm4) is molariform in structure, almost square in outline and with a low elevation in the central valley which fissures with wear (Fig. 5). m1 is smaller but otherwise similar in structure to pm4. m2 less reduced than in *C. sphinx* and with a more squarish outline; exceeds first premolar (pm1) in crown area. The dental formula used above follows the interpretation of Andersen (1912, page xxvii) for the Cynopterine section.

Baculum relatively massive; shaft ovoid and dome-shaped with a hollowed out ventral surface; tip small with a ventrally hooked projection. In Fig. 6, it is compared with *Cynopterus sphinx* and *Penthetor lucasi* (Dobson, 1880), a Cynopterine species which J. E. Hill (in Thonglongya 1972) considered closely related to *Latidens*. In both cases, differentiated not only by its much larger size but also morphology. Baculum of *C. sphinx* has characteristically well developed shoulders and simple unexpanded tip. In *P. lucasi*, general morphology of shaft is comparable to that of *Latidens* but tip is simple, essentially similar to that of *Cynopterus*.

Discussion

The six specimens of *Latidens salimalii* were collected in a broad-leaved montane forest, interspersed with coffee bushes, at an altitude of about 1500 feet (460 metres). They were caught at about 7.30 pm in a 42 foot mist net which was placed over the entrance of a natural cave. The cave, set in a rock face, measured 25 feet (7.7 m) in greatest depth; the entrance was approximately 45 feet (13.8 m) in greatest breadth by about 10 feet (3.1 m) in greatest height; it was screened to one side by bushes. It did not appear to be the diurnal roost of *Latidens* as no individuals were located within the cave prior to nightfall and all the specimens collected were caught as they attempted to enter the cave after dark. Possibly, the cave was used as a resting site during feeding. The diet of *Latidens* is not known. *Penthetor lucasi*, a species with an essentially similar dentition is known to feed on a wide variety of hard fruits and seeds from forest trees (Mickleburgh et al. 1992) and likewise *Thoopterus nigrescens* (Gray, 1871) has been observed feeding on wild figs (Bergmans & Rozendaal 1988). Nothing is known of the breeding biology of *Latidens*. Of the two male specimens examined, both had testes measuring 9.5 mm. The status of the species is still unclear. It is thought that the large number of bats seen flying near the cave during the evening were also *Latidens* but this is not proven. It was reported that the local estate workers collected bats from the vicinity of the cave on an intermittent basis, using the extracted body oils as a treatment for asthma.

The genus *Latidens* is one of fourteen Asiatic genera that have been placed in the Cynopterine section of the Pteropodidae, (Hill, p. 160 in Mickleburgh et al. 1992). The African genus *Myonycteris* Matschie, 1899 was also placed within this group, although as Andersen (1912) noted it is intermediate between *Rousettus* Gray, 1821 and *Cynopterus* F. Cuvier, 1824, but nearer the latter. *Latidens* would appear to be a specialised member of the Cynopterine section. It exhibits all the characters selected as typical of this group by Andersen (1912), namely: the rostrum is shortened; the basicranial axis of the skull is not deflected downwards; there is a reduction in the cheekteeth, with M2 and m3 absent; the palatal ridges are prominent; the odontoid papillae on the inner aspect of the lips are numerous; there is a reduction in the number of lower incisors; there are no postorbital foramina and the tail is completely suppressed. Hill (in Thonglongya 1972) suggested that *Latidens* is most closely allied to the south-east Asian genus *Penthetor* Andersen, 1912 on account of the general similarity in cheekteeth and to *Thoopterus* Matschie, 1899 on account of similarities in skull morphology. However it differs from all other genera in the Cynopterine section when a suite of characters are considered and the distinctive structure of the baculum may also prove to be an important generic character.

Acknowledgements

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Zusammenfassung

Im April 1993 wurden in den High Wavy Mountains, Tamil Nadu, sechs Exemplare des seltenen Indischen Flughundes *Latidens salimalii* gefangen. Die Gattung und Art war zuvor nur von dem 1948 gefundenen Holotypus bekannt. Die äußeren Merkmale sowie die des Schädels, der Zähne und des Baculum werden im Detail beschrieben.

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Table 1: External, cranial and dental measurements (mm) of *Latidens salimalii*.

Field No:	Holotype	MM221	MM222	MM223	MM224	MM225	MM226	$\bar{x}$	s
Sex:	male?	male	male	female	male	male	male		
Head & body:	—	109	107	109	108	105	102	106.7	2.7
Forearm:	68	66	67	67	69	68	66	67.3	1.1
Fifth metacarpal:	44.1	43.1	44.5	45.3	47.6	45.0	46.4	45.1	1.5
V ¹ : (first phalanx)	21.5	21.3	21.5	22.8	22.5	21.9	20.8	21.8	0.7
V ² : (second phalanx)	—	21.9	22.5	23.3	24.0	23.0	21.3	22.7	1.0
Fourth metacarpal:	44.4	43.3	46.0	45.6	48.1	45.3	45.3	45.4	1.5
IV ¹ :	24.5	24.0	25.2	26.7	26.3	25.4	24.9	25.3	1.0
IV ² :	27.0	26.1	26.3	28.4	29.1	25.4	26.5	27.0	1.3
Third metacarpal:	46.2	45.2	48.1	47.0	49.3	48.3	47.5	47.4	1.4
III ¹ :	31.8	32.1	33.2	33.0	32.3	32.9	32.0	32.5	0.6
III ² :	42.0	41.3	42.4	43.8	44.2	42.4	42.7	42.7	1.0
Second metacarpal:	30.5	30.6	32.1	31.4	32.1	30.4	30.5	31.1	0.8
II ¹ :	8.5	7.1	9.3	8.7	8.2	7.2	8.7	8.2	0.8
II ² :	6.1	5.0	6.1	5.3	5.1	4.7	5.6	5.4	0.5
First metacarpal:	9.2	7.8	8.8	10.4	9.2	9.9	10.3	9.4	0.9
I ¹ :	12.1	12.3	9.8	10.0	14.0	10.9	13.0	11.7	1.6
Wingspan:	—	456	466	452	472	472	434	458.7	14.6
Foot:	—	14.0	15.0	8.0	14.5	14.5	14.5	13.4	2.7
Tail:	0	0	0	0	0	0	0	0	—
Ear:	—	15.5	17.0	17.0	18.5	16.5	16.5	16.8	1.0
Tibia:	—	31.1	32.7	31.9	29.4	33.2	31.6	31.7	1.3
Calcar:	—	6.0	5.4	5.6	5.0	6.2	5.2	5.6	0.5
Greatest length of skull:	34.3	32.6	33.8	34.3	34.2	33.7	33.7	33.8	0.6
Condylbasal length:	33.8	31.4	32.6	32.9	33.0	32.1	32.1	32.6	0.8
Zygomatic breadth:	21.3	21.5	22.1	21.4	21.4	21.0	21.3	21.4	0.3
Interorbital constriction:	7.4	7.9	8.0	7.6	7.7	7.2	7.8	7.7	0.3
Postorbital constriction:	7.7	7.9	8.1	7.6	7.8	7.6	7.5	7.7	0.2

Table 1 continued: External, cranial and dental measurements (mm) of *Latidens salimalii*.

Field No:	Holotype	MM221	MM222	MM223	MM224	MM225	MM226	$\bar{x}$	s
Sex:	male?	male	male	female	male	male	male		
Breadth of braincase:	13.7	13.5	14.1	13.7	13.9	13.9	13.7	13.8	0.2
Breadth across canines, C1—C1:	6.1	6.5	6.5	6.7	6.4	6.2	6.6	6.4	0.2
Breadth across molars, M1—M1:	10.8	10.8	10.9	10.6	10.8	10.5	10.6	10.7	0.1
Upper tooththrow, C1—M1:	11.3	11.7	11.7	11.8	11.7	11.4	11.6	11.6	0.2
Median palatal length:	18.6	17.6	17.8	18.1	18.3	17.7	17.6	18.0	0.4
Width across hamular processes:	—	5.2	4.8	4.9	5.1	4.8	4.5	4.9	0.2
Mastoid breadth:	—	13.5	13.9	13.2	13.2	13.2	12.6	13.3	0.4
Mandible length:	26.3	24.8	25.7	26.3	26.1	25.6	25.8	25.8	0.5
Lower tooththrow, c1—m2:	12.4	12.6	12.5	12.7	12.9	12.5	12.6	12.6	0.2
2nd upper cheektooth (PM3), L:	2.6	2.6	2.5	2.6	2.5	2.5	2.5	2.5	0.1
2nd upper cheektooth (PM3), W:	1.8	2.0	1.9	2.0	1.9	1.9	1.9	1.9	0.1
3rd upper cheektooth (PM4), L:	2.4	2.5	2.4	2.4	2.3	2.7	2.4	2.4	0.1
3rd upper cheektooth (PM4), W:	2.2	2.1	2.0	2.0	1.9	1.9	2.2	2.0	0.1
4th upper cheektooth (M1), L:	2.1	2.1	2.2	2.1	1.9	2.1	1.9	2.1	0.1
4th upper cheektooth (M1), W:	1.7	1.8	1.7	1.7	1.6	1.6	2.0	1.7	0.1
2nd lower cheektooth (pm3), L:	2.5	2.8	2.6	2.7	2.7	2.9	2.5	2.7	0.1
2nd lower cheektooth (pm3), W:	1.9	2.1	1.9	2.0	2.0	1.9	1.9	2.0	0.1
3rd lower cheektooth (pm4), L:	2.5	3.0	2.7	2.6	2.5	2.7	2.4	2.6	0.2
3rd lower cheektooth (pm4), W:	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.2	0.1
4th lower cheektooth (m1), L:	2.1	2.4	2.2	2.2	2.1	2.2	2.1	2.2	0.1
4th lower cheektooth (m1), W:	2.0	2.0	1.9	2.0	2.1	2.0	2.0	2.0	0.1
5th lower cheektooth (m2), L:	1.3	1.3	1.4	1.1	1.6	1.4	1.3	1.3	0.2
5th lower cheektooth (m2), W:	1.1	1.3	1.1	1.0	1.4	1.2	1.2	1.2	0.1
Depth of mandib. ramus at pm4:	3.1	3.1	3.1	2.9	3.0	3.2	2.9	3.0	0.1
Depth of angular to coronoid:	11.6	11.2	12.1	11.8	11.1	10.8	11.1	11.4	0.5
Baculum, greatest length:	—	—	6.8	—	—	6.9	6.5	6.7	0.2
Baculum, greatest width:	—	—	3.6	—	—	3.7	3.3	3.5	0.2



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