Xinpusaurus is one of two thalattosaur genera known from the early Carnian (Upper Triassic) of Guizhou Province, P.R. China (Yin in Yin et al., 2000; Liu and Rieppel, 2001; Luo and Yu, 2002; Jiang et al., 2004). The genus originally was referred to the thalattosaur genus *Nectosaurus* by Yin and Rieppel (2001), whereas the description of part of the postcranial skeleton was based on a fifth specimen (Liu, 2001). The cranial anatomy of *Xinpusaurus suni* was the subject of further comments by Luo and Yu (2002) on the basis of yet another well-preserved, isolated skull. The second species, *Xinpusaurus bamaolinensis*, was described by Cheng (2003) on the basis of a single specimen. The species differs from *Xinpusaurus suni* in size and skull morphology, with *Xinpusaurus bamaolinensis* being nearly twice as large as *Xinpusaurus suni*. Differences in skull morphology include the striking overbite of the premaxillary rostrum in *Xinpusaurus bamaolinensis*, where the rostrum is longer than the rest of the skull, and the premaxilla extends anteriorly far beyond the dentary. Jiang et al. (2004) commented on the skull anatomy of *Xinpusaurus suni* once again, and described a new species, *Xinpusaurus kohi*, which, however, is a subjective junior synonym of *Xinpusaurus bamaolinensis* Cheng (2003). Their phylogenetic analysis showed *Xinpusaurus* to be the sister taxon of *Nectosaurus* from the Upper Triassic of California (Merriam, 1905, 1908; Nicholls, 1999). This relationship of *Xinpusaurus*, previously reported by Liu and Rieppel (2001), now seems highly questionable in the light of ongoing research on the rostrum morphology in *Nectosaurus* and other thalattosaurs (Rieppel, Müller, and Liu, in press). Here, we will not comment further on analyses of the phylogenetic relationships of thalattosaurs, but rather describe a new skull of *Xinpusaurus suni* (Figs. 1, 2), which is the best preserved in its genus and thus helps to clarify a number of previously problematic issues of cranial anatomy. Indeed, it turns out that the motivation for the repeated revisions of the skull anatomy of *Xinpusaurus suni* were uncertainties and ambiguities that resulted from the partially problematic preservation of previously available specimens. The new skull described here (Figs. 1, 2) is kept at the Institute of Vertebrate Paleontology and Paleoanthropology of the Chinese Academy of Sciences (IVPP V14372). Like the skulls of *Xinpusaurus suni* described by Liu and Rieppel (2001) and Luo and Yu (2002), the new specimen was completely removed from the surrounding matrix and mechanically prepared from both sides. As are all the other specimens, this skull is from the early Carnian Wayao member of the Falang Formation (L. Wang et al., 2001; the Falang Formation is also known as the Xiaowa Formation: X. Wang et al., 2002, 2003), and it is somewhat smaller that the specimen described by Liu and Rieppel (2001).

### Description of a New Skull of *Xinpusaurus Suni*

As preserved, the skull of IVPP V14372 (Figs. 1, 2) is 101 mm long, with the tip of the rostrum missing. The distance from the broken tip of the rostrum to the anterior margin of the (right) orbit is 40.8 mm; the longitudinal diameter of the right orbit is 29.8 mm. The distance from the posterior margin of the (right) orbit to the posterior margin of the quadrate is 22.3 mm.

As in the previously described specimen IVPP V11860 (Liu and Rieppel, 2001; Fig. 3), the anterior tip of the maxilla turns sharply upwards to form a distinct, anteroventrally facing concavity in the alveolar margin of the upper jaw as it tapers out along the ventral margin of the posterior part of the premaxilla (Fig. 2A, C). Two enlarged and strongly procumbent teeth are located within this concavity (three such teeth are located in the same area in specimen IVPP V11860; Fig. 3). The anterior end of the rostrum was originally described as ventrally deflected in *X. suni* (Liu and Rieppel, 2001), an observation that was not confirmed by the specimen described by Luo and Yu (2002). Specimen IVPP V14372 again indicates some ventral deflection of the rostrum, whereas the rostrum appears to be straight in *X. bamaolinensis*.

Upon detailed examination of both skulls of *X. suni* (IVPP V11860 and V14372), the best possible interpretation of the structure delineating the anterior tip of the maxilla, along with the surface ornamentation of the bone and the arrangement of the row of superior alveolar foramina, is that the maxilla terminates within the anterodorsal curvature of the alveolar margin of the upper jaw (Figs. 2A, C, 3). No diastema therefore separates the maxillary from the premaxillary teeth; such a diastema is also absent in *X. bamaolinensis* (Jiang et al., 2004: fig. 3). Of all the teeth, the anterior maxillary and the posterior premaxillary, as well as the opposing dentary teeth, are the largest. They form robust, conical elements that terminate in a fairly blunt tip. More posteriorly, the maxillary teeth and the opposing dentary teeth form low, blunt, crushing tooth crowns. The enamel surface is striated, a feature most clearly expressed close to the base of the tooth crown.

The arrangement of the bones surrounding the external naris has been a matter of contention (Jiang et al., 2004), but it is very clearly exposed in the new specimen IVPP V14372 (Fig. 2A). The elongate and slit-like opening of the external naris lies at the bottom of a distinct, oval depression or recess. The upper part of this recess is formed by the nasal bone, which is a spindle-shaped element that forms the dorsal, anterior, and posterior margins of the external naris. It meets the premaxilla at the anterolateral, and the maxilla at the posterolateral margin of the external naris. In IVPP V14372, the posterior process of the premaxilla broadly enters the anterior half of the ventral margin of the external naris, but in IVPP V11860 (Fig. 3), it only very narrowly enters its anterolateral corner. The participation of the premaxilla in the formation of the ventral margin of the external naris is thus subject to individual variation.

The nasal projects both anteriorly and posteriorly to the external naris; the anterior projection is shorter than the posterior projection, the latter terminating in a more narrowly pointed tip (Figs. 2A, 3). The posterior projection of the nasal is embraced by the anterolateral and anteromedial processes of the frontal. The anteromedial process of the frontal is longer (reaches farther anteriorly) than the anterolateral one (Fig. 2A). The contact