

New Ammonoids from the Subfamily Proplanulitinae Buckman from the Upper Part of the Lower Callovian of Central Russia

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Abstract—Two new ammonoid species *Proplanulites (Proplanulites) irinae* and *P. (P.?) rogovi* (the most recent known fossils that can be undoubtedly assigned to the subfamily Proplanulitinae) are described from the terminal *enodatum* Subzone of the Lower Callovian *calloviense* Zone from the well-known outcrop on the Oka River, near the village of Nikitino. A zonal and subzonal subdivision of the Lower and Middle Callovian beds near the village of Nikitino is proposed.

INTRODUCTION

The subfamily Proplanulitinae includes Lower Callovian perisphinctoid ammonites with compressed and relatively involute whorls, with a narrowly rounded venter and wide prorsiradiate primary ribs that are raised on the umbilical shoulder, and thinner secondary ribs that are interrupted or weaken across the venter.

This taxon was erected by Buckman (1909–1930) as a separate family and until now it is regarded as a family by some French workers (e.g., *Biostratigraphie du Jurassique...*, 1997).

The first major revision of Jurassic ammonites redefined the family Proplanulitinae to include (apart from the Early Callovian subboreal genus *Proplanulites* Teisseyre) the Callovian Tethyan genera *Kinkeliniceras* Buckman, *Obtusocostites* Buckman, *Sivajiceras* Spath, and *Cutchisphinctes* Spath (*Treatise...*, 1957). Later, Donovan *et al.* (1980) restricted this family to include only *Proplanulites* and tentatively *Obtusocostites*. In a recent paper Westermann (1993), referring to the opinion of J. Callomon noted that the Proplanulitinae *s. str.* is a small Early Callovian taxon that was endemic (neoendemic) to the subboreal regions of Europe, while the group *Obtusocostites*–*Kinkeliniceras* represents an independent phylogenetic lineage evolving in the Indo-African Province of the Tethyan Region. In this paper the subfamily Proplanulitinae is considered *sensu stricto* (i.e., including only the nominative genus).

The genus *Proplanulites* appears in the Subboreal (Boreal-Atlantic) Region at the beginning of the Early Callovian *koenigi* phase. Apparently, it evolved from within the subfamily Pseudoperisphinctinae Schindewolf, most likely from *Homeoplanulites* Buckman. The *koenigi* phase coincides with the radiation of the genus. At that time species of this genus were widely distributed not only in Subboreal Europe (Callomon *et al.*, 1988, 1989, 1992; Page, 1989; *Biostratigraphie du Jurassique...*, 1997; Meledina, 1987; Olfer'ev *et al.*, 1992) an others but reached the Kazakhstan region

(Repin and Rashvan, 1996a, 1996b) in the southeast, Submediterranean Europe (*Biostratigraphie du Jurassique...*, 1997) in the southwest, and eastern Greenland (Callomon, 1993) in the north. In the second half of the *koenigi* phase in the West European Paleobasin the genus *Proplanulites s. str.* is replaced by the subgenus *Crassiplanulites* Buckman that differs in having wider whorls and coarser ornamentation.¹ Representatives of this subgenus occur in the English successions up to the top of the nominative subzone of the *calloviense* Zone, terminal in the Lower Callovian (Callomon *et al.*, 1988; Page, 1989). No undisputed Proplanulitinae have been recorded from the *enodatum* Subzone of the *calloviense* Zone.

RESULTS

During a Field Trip in the summer of 1997, a rich ammonite assemblage containing two new *Proplanulites* species (*P. (P.) irinae* [M] and *P. (P.?) rogovi* [m]) was collected from the well-known outcrop in the vicinity of the village of Nikitino (Ryazan Region) from the *enodatum* Subzone.

The outcrop of Jurassic and Lower Cretaceous beds in the vicinity of the village of Nikitino has been well known since the 19th century. Sazonov (1957, 1965) published one the most recent descriptions of this sequence. The basal bed of oolitic marls in this section is regarded by Sazonov to be paleontologically and lithologically homogeneous and is dated as Middle Callovian. Detailed study showed that this sequence may be subdivided into several units, showing a series of ammonite assemblages replacing each other. A description of the Lower and Middle Callovian assemblages in

¹ *Proplanulites basileus* Buckm., from the basal *gowerianus* Subzone of the *koenigi* Zone of the Schwabian Alps, that Callomon *et al.*, 1992 assigned to the subgenus *Crassiplanulites* apparently should be assigned to *Proplanulites s. str.* since this species has relatively narrow whorls and smooth ornamentation.

the vicinity of the village of Nikitino and their zonal and subzonal subdivision is given below.

From the low water mark the following beds are exposed.

Lower Callovian

koenigi Zone

curtilobus Subzone

1. Yellowish, oolitic, platy marl. According to D.N. Kiselev (pers. comm.) this bed contains scarce impressions and distorted *Kepplerites* (*Gowericeras*) cf. *curtilobus* (Buckm.). Thickness 0.05–0.1 m.

calloviense Zone

calloviense Subzone

2. Yellowish-grey, strongly, oolitic, with nodules of grey and yellowish-grey oolitic marl. Ammonites: *Sigaloceras* (*Sigaloceras*) *calloviense* (Sow.), *S.* (*S.*) cf. *calloviense* (Sow.) (ex. gr. *micans* Buckm.), *Proplanulites* (*Proplanulites*) cf. *irinae* sp. nov. Thickness 0.1–0.3 m.

enodatum Subzone

3. Grey and yellowish-grey, highly clayish, oolitic aleurite, with large nodules of very compact, grey, oolitic marl. Ammonites: *Sigaloceras* (*Catasigaloceras*) *enodatum* (Nik.), *S.* (*C.*) *planicerclus* (Buckm.) (maybe considered as a late chronosubspecies of *S.* (*C.*) *enodatum*), (*Gulielmina* ? *anterior* (Brinkm.), *Cadoceras* (*Cadoceras*) *proniense* Sas., *C.* (*C.*) cf. *tschefkini* (d'Orb.), *C.* (*Rondiceras*) *milashevici* (Nik.), *Pseudocadoceras* (*Pseudocadoceras*) *homoemorphum* Kis., *P.* (*Novocadoceras*) ex gr. *suraense* (Sas.), *Indosphinctes* (*Indosphinctes*) *peregrinus* Spath, *I.* ex gr. *rusticus* Spath, *Elatmites* sp. ind., *Choffatia* (*Choffatia*) *cardoti* (Petcl.), *C.* (*C.*) cf. *prorsocostata* (Siem.), *Proplanulites* (*Proplanulites*) *irinae* sp. nov., *P.* (*P.*?) *rogovi* sp. nov. Thickness 0.3–0.5 m.

Middle Callovian

jason Zone

4. Grey, oolitic, very aleuritic clay. At the base the bed contains a layer of large nodules composed of compact grey oolitic marl. Ammonites: *Kosmoceras* (*Gulielmites*) *medea* Call., *K.* (*G.*) *jason* (Rein.), *Gulielmiceras* spp., *Cadoceras* (*Rondiceras*) sp. juv., *Indosphinctes* (*Indosphinctes*) cf. *mutatus* (Trautsch.). Thickness 0.2–0.3 m.

coronatum Zone

obductum Subzone

5. Brownish, clayish, oolitic aleurite. Near its base the bed contains *Kosmoceras* (*Gulielmites*) *obductum* (Buckm.) and *Gulielmiceras* sp. ind. Thickness 0.2–0.3 m.

grossouvrei Subzone

6. Yellowish-grey and greyish-brown, on the surface dark-red, oolitic marl that may horizontally be replaced in the upper part by the aleurite and loose greyish-

brown clayish oolitic aleurite, dark red in the weathered places. The top of the bed often has features of hardground. Ammonites: *Erymnoceras* (*Erymnoceras*) *coronatum* (Brug.-d'Orb), *E.* (*E.*) *baylei* (Jeann.), *E.* (*Rollierites*) *renardi* (Nik.), *E.* (*Erymnoceras*) cf. *leutharti* (Jeann.), *Kosmoceras* (*Zugokosmoceras*) *grossouvrei* Douv., *K.* (*Kosmoceras*?) *pollucinum* Teiss., *K.* spp., *Gulielmiceras* spp., *Binatisphinctes* sp. ind., *Hecticoceras* spp. The species *Pseudopeltoceras* cf. *aff. chauvinianum* (d'Orb.) also occurs near the top. Thickness 0.2–0.25 m.

In the upper part of the section, after a gap that apparently corresponds with the basal *phaenium* Subzone of the *athleta* Zone, beds of the Upper Callovian and Oxfordian dark grey clays are exposed.

Below are descriptions of species of the subfamily Proplanulitinae from the *enodatum* Subzone near the village of Nikitino. Material is housed in the Paleontology Department of Moscow State University (MGU).

SYSTEMATIC PALEONTOLOGY

Family Perisphinctidae Steinmann, 1890

Subfamily Proplanulitinae Buckman, 1921

Genus *Proplanulites* Teisseyre, 1887

Subgenus *Proplanulites* Teisseyre, 1887

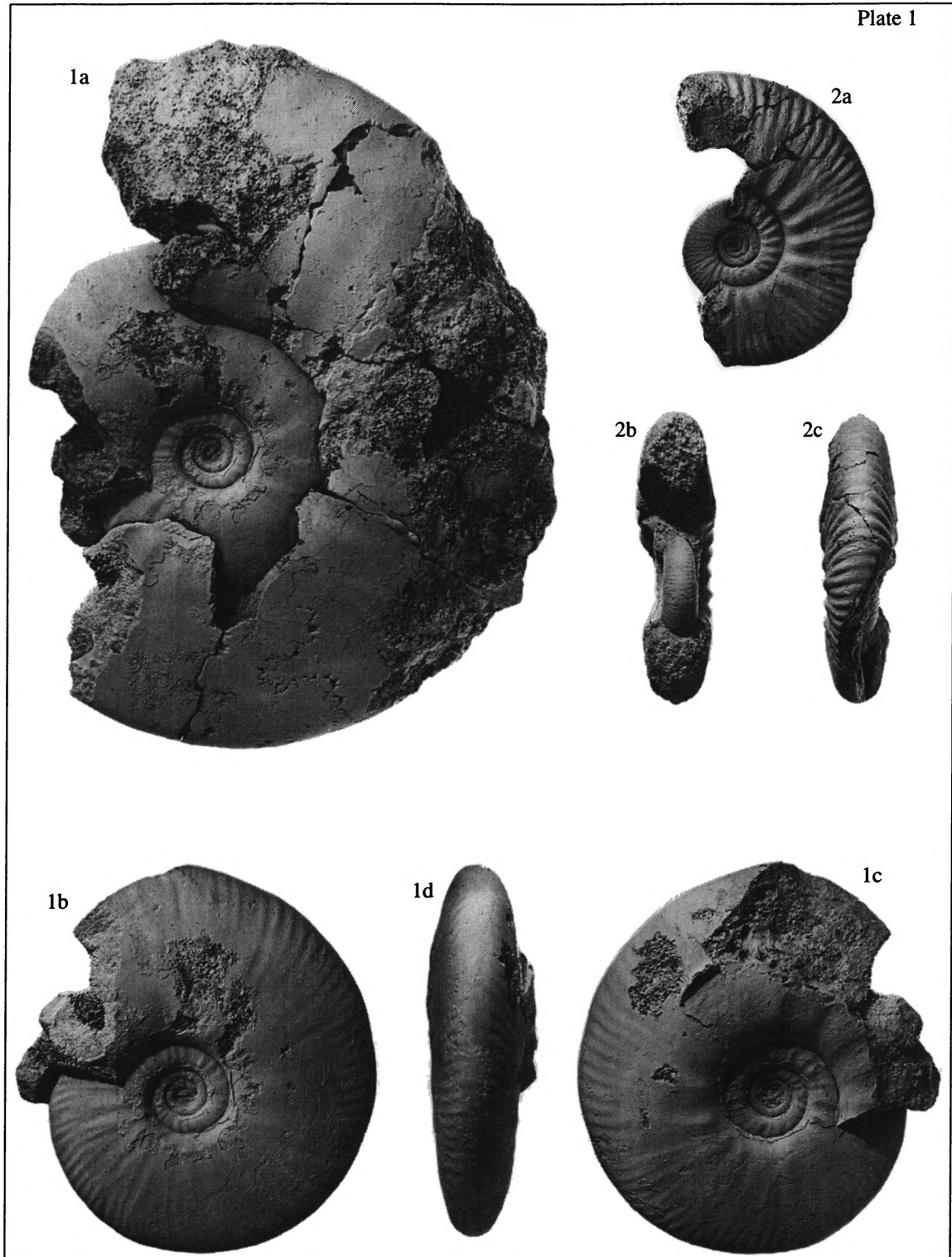
Proplanulites (*Proplanulites*) *irinae* Gulyaev, sp. nov.

Plate 1, fig. 1

E t y m o l o g y. From the woman's name Irina.

H o l o t y p e. MGU, no. 7/1399; Ryazan Region, village of Nikitino; Lower Callovian, *calloviense* Zone, *enodatum* Subzone.

D e s c r i p t i o n. The shell is large (over 180 mm), compressed, from moderately involute in the early and median stages to semi-involute or moderately evolute at the later stages. The early whorls are compressed in cross-section, rounded-trapezoid. At the median stages the cross-section approximates a compressed rounded-trapezoid outline, and at the latest stages it is strongly compressed and oval. Up to a diameter of 50–60 mm the relative whorl height rapidly increases, then gradually decreases. The degree of whorl overlap decreases as the shell grows: the early and median whorls (diameter is up 80–90 mm) embrace 3/4 to 2/3 of the height of the previous whorls, the last whorls (diameter is more than 115–125 mm) embrace only 1/2 or even less of the height of the previous whorl. The flanks are weakly convex, the venter is narrowly rounded, especially at the median stages. The umbilicus is small and stepped, with sloping walls and rounded umbilical shoulder. It is moderately narrow in the early and median whorls, and medium-sized and moderately wide in the last whorls. The relative umbilical width gradually decreases in ontogeny from a shell diameter of 50–60 mm, and slowly increases from a diameter of 70–80 mm.



Explanation of Plate 1

All sizes are natural.

Fig. 1. *Proplanulites (Proplanulites) irinae* sp. nov.; holotype no. 7/1399; (1a) shell with last whorls, lateral view; (1b–1d) shell without last whorls: (1b) from the right, (1c) from the left, and (1d) ventral view; village of Nikitino; Lower Callovian, *calloviense* Zone, *enodatum* Subzone.

Fig. 2. *Proplanulites (Proplanulites?) rogovi* sp. nov.; holotype no. 7/1400; (2a) lateral view, (2b) apertural view, (2c) ventral view; village of Nikitino; Lower Callovian, *calloviense* Zone, *enodatum* Subzone.

The ribbing is weak, generally smooth. The ribs are three- and four-branched, with one–two ribs usually intercalating in between. The branching point is between 1/3 and 1/2 whorl height. The holotype (diameter 58 mm) has 9 primary and 59 secondary ribs in half of a whorl, the ribbing coefficient is 5.78; at a diameter of 68 mm it is 8, at 42 mm it is 5.25. The primary ribs are wide, widely spaced, weakly slanting orad, elevated on the umbilical shoulder. As the shell grows the primary ribs gradually smoothen and transform into sloping plications that occur in the lower part of the whorl at least up to a diameter of 130 mm. Secondary ribs are thin, widely spaced, slanting orad and gently curved. In the venter they are interrupted and become smooth at the bifurcation point at a diameter of 35–45 mm. The distal elements of the secondary ribs remain in the upper part of the flank up to a diameter of 90–100 mm.

Dimensions in mm and ratios:

Specimen no.	Dm	WH	WW	UW	WH/Dm	WW/Dm	UW/Dm
Holotype 7/1399	123	47	30	36	0.38	0.24	0.29
	95	40	25	24	0.42	0.26	0.25
	87	38	23	21	0.44	0.26	0.24
	68	31	19	15.5	0.46	0.28	0.23
	58.5	26	16	13.5	0.44	0.27	0.23
	52	24	14	12	0.46	0.27	0.23

Comparison. This species most closely resembles *P. (P.) laevigatus* Buckm. in its shell shape and ornamentation, but differs in the narrower umbilicus of the median whorls, the weaker primary ribs, and the narrower venter. The new species resembles a species from Mangyshlak figured by Repin and Rashvan (1996b, pl. 21, fig. 4) as *?Indosphinctes (Indosphinctes) choffati* (Par. et Bon.) *duals* Repin that apparently correspond to *Proplanulites*. *P. (P.) irinae* differs from this species in the narrower umbilicus and more narrowly rounded venter.

Remarks. In the section near the village of Nikitino, beds referred to the *calloviense* Subzone yielded a fragment of ammonite shell that was quite similar to the species under description. However, poor preservation complicates positive assignment and the species may be identified only in open nomenclature.

Material. Holotype (collected by M.A. Rogov) and three shell fragments from the type locality (collected by myself).

Proplanulites (Proplanulites?) rogovi Gulyaev, sp. nov.

Plate 1, fig. 2

Etymology. After M.A. Rogov.

Holotype. MGU, no. 7/1400; Ryazan Region, village of Nikitino; Lower Callovian, *calloviense* Zone, *enodatum* Subzone.

Description. The shell is medium-sized (approximately up to 8–9 cm), compressed, semi-involute. The cross-section is high, rounded-trapezoid, with a maximum width at the umbilical shoulder. The relative whorl height increases in ontogeny. The degree of whorl overlap gradually decreases only in the adult living chamber. The flanks are very weakly convex, the venter is moderately narrowly rounded. The umbilicus is medium-sized, shallow, stepped, with moderately sloping wall, and with a more or less rounded umbilical shoulder. The relative umbilical width gradually decreases in ontogeny.

The ornament is prominent and coarse. The ribs are three-branched, more rarely two- or four-branched, and there are individual intercalating ribs. The bifurcation point is between 1/3 and 1/2 of the whorl height. The holotype, which has a diameter of 51 mm, contains 11 primary and 35 secondary ribs in half of the whorl. The ribbing coefficient is 3.18. The primary ribs are coarse, wide, weakly slanting orad. The secondary ribs are also quite coarse, slanting orad, very gently curved, weakened but uninterrupted in the venter.

Dimensions in mm and ratios:

Specimen no.	Dm	WH	WW	UW	WH/Dm	WW/Dm	UW/Dm
Holotype 7/1400	51	19	14.5	17	0.37	0.28	0.33
	23.5	9	8	8	0.38	0.34	0.34
	17	6.5	6	6	0.38	0.35	0.35

Comparison. This species differs from *P. (P.) irinae* mainly in the smaller shell, with lower whorls, a wider umbilicus, a more widely rounded venter and coarser and less differentiated ornamentation. The species under description is close to a species from Mangyshlak described by Repin and Rashvan (1996b, p. 56, pl. 19, fig. 6) as *Proplanulites teisseyeri* Tornq., although differing in the coarser ornamentation and slightly more open umbilicus.

Material. Holotype (collected by M.A. Rogov) and a fragment of a whorl from the type locality (collected by myself).

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