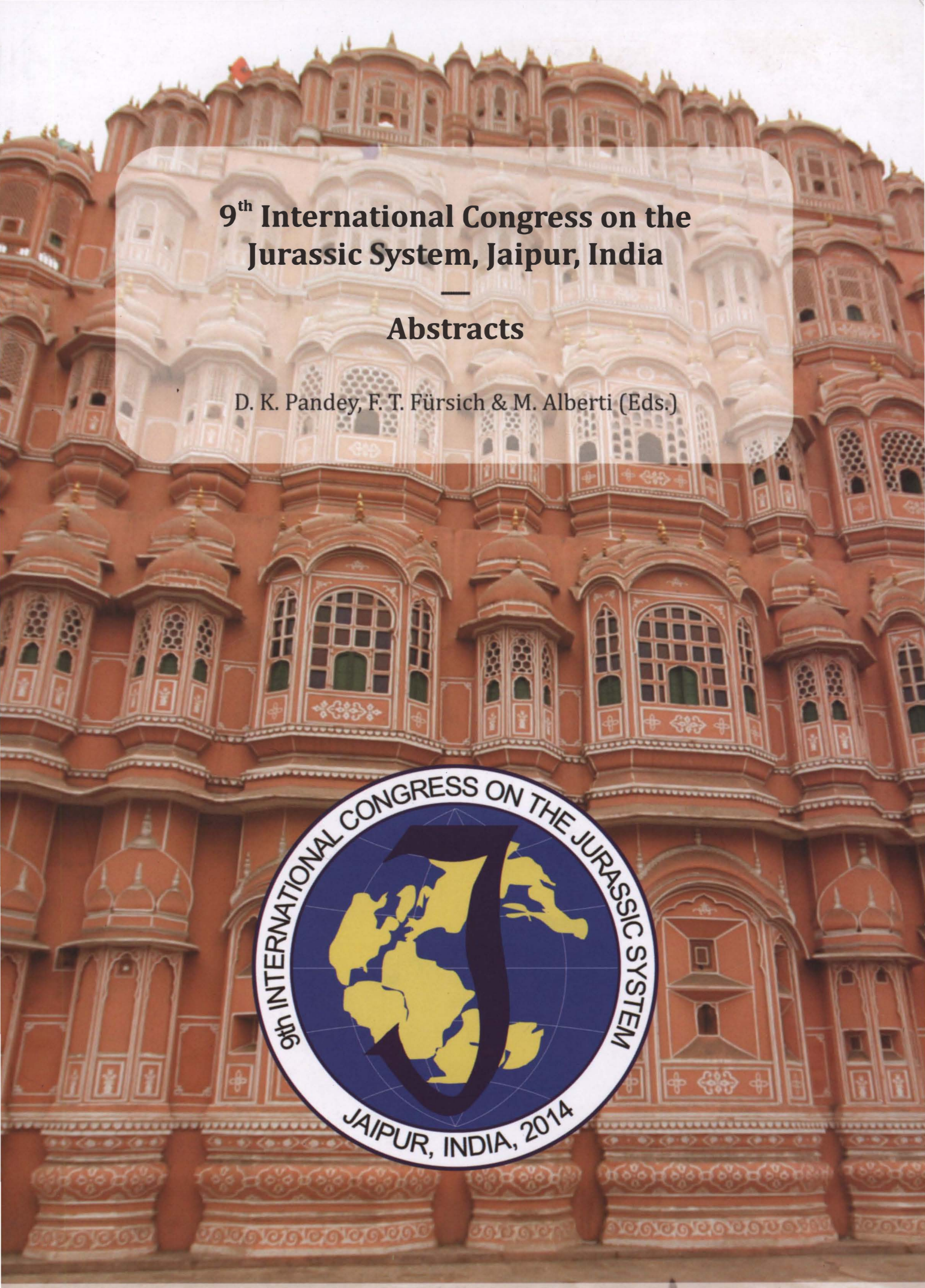

9th International Congress on the Jurassic System, Jaipur, India

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New data on the Lower-Upper Kimmeridgian boundary beds of southern Tatarstan, Central Russia

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The lowermost and uppermost Kimmeridgian deposits of Central Russia are relatively widely distributed and fairly well known, while Lower-Upper Kimmeridgian boundary beds are missing or strongly condensed in nearly all sections and were not investigated in detail so far. It should be noted that the position of the Lower-Upper Kimmeridgian boundary (the base of the Mutabilis Zone) in the Subboreal succession remains the matter of discussion during the last decades. Traditional definition of this boundary by FAD of *Aulacostephanoides* is widely accepted (MESEZHNIKOV 1984; HANTZPERGUE et al. 1997, 1998). Since the transition from *Rasenioides* to *Aulacostephanoides* (*Aulacostephanites*) is very gradual with co-occurences of specimens with or without ventral rib interruption (cf. ARKELL & CALLOMON 1963; BIRKELUND et al. 1978), English authors have proposed the FAD of *Rasenioides* (i.e., the base of the Askepta Subzone) as the marker of the base of the Mutabilis Zone (BIRKELUND et al. 1983). The latter definition of the Lower-Upper Kimmeridgian boundary is, however, unclear in those regions, where *Rasenioides* is rare or absent (i.e. the whole Arctic, Russian Platform etc.), whereas in the Submediterranean succession the boundary in question lies within the Hypselocyclum Zone (MATYJA & WIERZBOWKSI 2000). Here we follow the older definition of the Mutabilis Zone and its lower boundary by FAD of *Aulacostephanoides.*

Ammonites from the boundary of the Cymodoce and Mutabilis zones of the Russian Platform are generally poorly known. Only a few specimens of such ammonites were figured or mentioned since the end of the 19th century and the position of all these records within succession remains unclear. Moreover, the presence of the Mutabilis Zone has been suggested based on a single historical record of the ammonite *Aspidoceras liparum* (= *A. lallierianum* (D'ORB.) in PAVLOW 1886: pl. 9, fig. 3).

During fieldwork in 2010 and 2011 we studied key sections of the Lower-Upper Kimmeridgian boundary beds, located at the Volga river bank close to the border between the Ulyanovsk Region and the Tatarstan Province of Russia. High cliffs at the right bank of the Volga river, located along a few kilometers from Mimei to Tarkhanovskaya Pristan (HANTZPERGUE et al. 1998), are consist mainly of the Kimmeridgian and only occasionally of underlying Middle Jurassic deposits. The Kimmeridgian succession is mainly represented by grey to light-grey calcareous silty clay with a total thickness of ca. 15 m with a well visible band of dark-grey to brown oil shales having TOC contents of up to 12.4%.

The following ammonite succession could be recognized here:

(1) *Crussoliceras* spp., *Rasenioides* spp., *Amoebites* cf. *modestum* (MESEZHN. & ROMM). Remains of the same assemblage with *Crussoliceras* are known also from other areas of the Russian Platform (Kostroma, Kaluga, and Moscow regions). In the Tver region (BUEV 2012) *Amoebites kitchini* (SALF.), *Rasenioides* (*Semirasenia*) *discoides* HANTZ. and *Aspidoceras binodum* (OPP.) are also found in this assemblage. The assemblage could be distinguished as the *lacertosum* horizon after the most common microconchiate species of *Crussoliceras*. Co-occurrence of Boreal, Subboreal, and Submediterranean ammonites allows correlation of this unit with the Divisum

Zone of the Submediterranean succession, the *discoides* horizon of the Subboreal Cymodoce Zone, and the Boreal Kitchini Subzone.

(2) *Amoebites* sp. nov. (*beaugrandi* auct. non SAUVAGE, 1871), *Aulacostephanoides* spp., dominated by small-sized coarsely-ribbed *Amoebites*. It roughly corresponds to "faunas" with *Amoebites* aff. *beaugrandi* of East Greenland and Spitsbergen in the Modestum Subzone of the Kitchini Zone. Unfortunately, aulacostephanid ammonites collected along with *Amoebites* are mainly represented by fragmentary preserved juveniles and their precise identification is difficult. Nevertheless, the presence of a well developed smooth band at the venter of these ammonites confirms their identification as *Aulacostephanoides*, typical of the Mutabilis Subzone of the Mutabilis Zone.

(3) Slightly above the unit with coarse-ribbed *Amoebites*, a single specimen of *Zenostephanus sachsi* (MESEZHNIKOV) has been found. This species is typical of the sachsi horizon of Spitsbergen and Franz-Josef Land and perhaps it occurs at nearly the same level in East Greenland (cf. SYKES & SURLYK 1976: fig. 7A).

(4) Overlying light-grey to grey clays (uppermost 2.8 m of clayey unit) and brownish oil shales are characterized by a nearly homogeneous ammonite assemblage, consisting of *Aulacostephanoides* sp. and aspidoceratids, accompanied by poorly preserved cardioceratid microconchs. This assemblage also belongs to the Mutabilis Subzone.

(5) The presence of *Orthaspidoceras liparum* (OPPEL) and *O. lallierianum* (D'ORB.) above the oil shales marks the base of the uppermost subzone of the Mutabilis Zone (Lallierianum Subzone) and its basal *lallierianum* horizon. The uppermost horizon of this subzone (*schilleri* horizon) is unknown from the Russian Platform.

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