Ammonite findings from Byers Peninsula, Livingston Island, Antarctica

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Byers Peninsula is the largest ice-free area of Livingston Island, South Shetland Islands, Antarctica. Exposed Upper Jurassic–Lower Cretaceous sedimentary and volcanic rocks are included in Byers Group, which is composed of formal lithostratigraphic units. According to Crame et al. (1993) sedimentary and volcanic successions are grouped into 4 formations as follows: Anchorage Formation (Kimmeridgian–Tithonian), Devils Point Formation (Berriasian), President Beaches Formation (Berriasian) and Chester Cone Formation (Valanginian). Afterward Hathaway and Lomas (1998) revised the lithostratigraphical scheme of Crame et al. (1993) and proposed some new formal lithostratigraphic units: Anchorage Formation (Kimmeridgian–Tithonian), President Beaches Formation (Berriasian) and Chester Cone Formation (Valanginian). Afterward Hathaway and Lomas (1998) revised the lithostratigraphical scheme of Crame et al. (1993) and proposed some new formal lithostratigraphic units: Anchorage Formation (Kimmeridgian–Tithonian), President Beaches Formation (Berriasian) and Chester Cone Formation (with Devils Point Member and Sealer Hill Member) (?)Upper Berriasian to Valanginian) and Cerro Negro Formation (Aptian).

During the field season in 2016 we found a relatively abundant ammonite fauna in the SW part of Byers Peninsula at the vicinity of Devils Point and President Beaches areas (Fig. 1). Ammonite specimens from Devils Point area were collected from mid, dark-grey mudstones intercalated between coarse-grained sandstones beds. Mudstone-dominated sequences and coarse-grained clastic rocks, cropping out in the Devils Point area, are part of Devils Point Formation (Berriasian) according to Crame et al. (1993). Later Hathaway and Lomas (1998) include this sequence at the base of Chester Cone Formation as Devils Point Member (?)Upper Berriasian). More abundant ammonite fauna was obtained from very coarse-grain, green sandstones in the southwestern part of President Beaches area (Fig. 1). Sedimentary rocks exposed in the most western part of the Peninsula (including our locality) are composed mainly of mudstones and small sandstone bodies, which were combined in President Beaches Formation (Berriasian). These formal units are the most fossiliferous part of Byers Group. The obtained ammonite fauna have already been subject of investigation from Chilean paleontologists and subsequently listed by Smellie et al. (1980). Based mainly on ammonite taxa (obtained from different localities at the Peninsula) the age of Byers Group was determined as Kimmeridgian to Valanginian.

In the locality in Devils Point area we recognized Haplophylloceras strigile (Blanford, 1864) and Protancylloceras sp. indet. The first one is known from the Indo-Pacific and Antarctic Realms. It is characteristic species for the Uppermost Tithonian and/or for the base of the Berriasian (Thompson, 1979; Yin, Enay, 2004). We consider that the ammonite findings from Devils Point Fm indicate Latest Tithonian–Early Berriasian age.

The following ammonite taxa were identified in the locality of President Beaches area: Spiticeras (Spiticeras) spitiensis (Blanford, 1864), S. biloba­tum (Uhlig, 1903), ?Spiticeras triradiatum lovalde­sensis Biro-Bagoczky, 1980 and Argentiniceras lon­chochense (Steuer, 1897). Traditionally, the representatives of genus Argentiniceras have been often report­ed from the Lower Berriasian of Argentina and Chile, as well from Alexander Island, Antarctica. Rare find­ings are known from India and Yemen. Argentiniceras noduliferum is used as an index-species of zone, which quite recently had been positioned at the base of the Berriasian of Argentina and Chile (Aguirre-Urreta et al., 2007). Lately, the range of this zone was revised, corresponding to S. occitana Zone and partly to the S. boissieri Zone from the Standard Mediterranean.
Zonal scheme (Riccardi, 2015). Argentiniceras lonchochense is a characteristic element of the ammonite association of the Argentiniceras noduliferum Zone. Genus Spiticeras has a wide geographical distribution and its range passes through the Jurassic/Cretaceous boundary. However, its major abundance was reported from Berriasian, including Antarctic area (Thompson, 1979). Spiticeras damesi was served as a zonal index for the Upper Berriasian of the Andean basins and corresponds to S. boissieri Zone in the Tethyan Mediterranean zonation (Aguirre-Urreta et al., 2007). This species is considered by some authors to be a synonym of Spiticeras tripartitum and it has the same range. Based on newly collected ammonite fauna we suggest Upper Berriasain age of this interval of President Beaches Formation.

The biostratigraphic interpretation of the newly collected fauna from the two localities allowed us to establish Upper Tithonian–Lower Berriasian age for Devils Point Fm and ?Upper Berriasian age for President Beaches Fm. Thus, the specified age gave us a reason to conclude that the Devils Point Fm has position below the President Beach Fm in accordance with the scheme of Crame et al. (1993).

References