Thoms 2004, 2006) für Esri™ ArcPad entwickelten Applets. Die ursprüngliche Anwendung diente als Vorlage und Orientierungshilfe bei der Entwicklung eines eigenen, auf die Bedürfnisse der Geologischen Landesaufnahme an der Geologischen Bundesanstalt zugeschnittenen Kartierungssystems.

GDA++ wurde für die Verwendung auf einem PDA oder Smartphone optimiert, kann jedoch auf jedem PC oder Tablet PC in Verbindung mit ArcPad (getestet ab Version 7.11) eingesetzt werden. Alle Funktionen des Programmes stehen in Form einer eigenen Werkzeugleiste zur Verfügung und erlauben eine rasche, aufgabenorientierte Dateneingabe im Gelände.

Folgende Kartierungsdaten können als eigene Objekte im GIS erfasst werden:

- **Aufnahmepunkte** - in Verbindung mit umfangreichem Freitext, einer Skizze, Proben, Fotos und Strukturdaten. Diese können auch in Abhängigkeit von einem bereits eingegebenen Punkt über die Angabe von Richtung und Entfernung zur neuen Position eingegeben werden. Komplexe Strukturdaten werden zu frei definierbaren Objekten wie Falten, Störungen zusammengefasst.
- **Einfache Strukturdaten** - wie Schichtfallen, Faltenachsen etc. die in geologischen Karten mit einem Symbol dargestellt werden, werden gesondert erfasst.
- **Quellen** - in Verbindung mit Daten zum Quelltyp, Quellaustritt, Schüttung, Leitfähigkeit und pH.
- **Flächen** - inklusive geol. Einheit und Lithologie jedoch ohne Berücksichtigung einer Topologie.
- **Linien** - verschiedene Typen wie Schichtgrenzen, Störungen etc.
- **Wegenetz** - erlaubt die Erfassung von Wegen, Forststrassen usw. die noch nicht in der topografischen Karte vorhanden waren.

Alle Einträge sind an den Benutzer gebunden und mit einem Zeitstempel versehen. Eine einem Aufnahmepunkt oder einer Fläche bzw. einem einfachen Strukturwert zugeordnete geologische Einheit ist automatisch mit ihrem lithologischen Inhalt verbunden. Diese Einheit kann jedoch mehrere Subformationen enthalten die als Auswahl angezeigt werden. Ist eine Einheit oder Lithologie noch nicht vorhanden, kann sie vom Benutzer angelegt werden und wird gemeinsam mit einem RGB Farbwert in der Datenbank gespeichert. Die für die Darstellung notwendigen Symboldateien werden daraufhin überschrieben und die Karte aktualisiert.

Alle an Aufnahmepunkte gebundenen Daten können über eine Exportfunktion in eine HTML Datei geschrieben und danach in gut lesbarer Form ausgedruckt werden. Auch die Übernahme der Daten in ein ESRI™ ArcGis Projekt ist problemlos möglich - die erweiterten Bearbeitungsmöglichkeiten von GDA++ sind unter ArcGis jedoch nicht verfügbar. Mit der beschriebenen Funktionalität erfüllt GDA++ einen Großteil der Aufgaben die ein modernes DGM (digital geologic mapping) System (Clegg et al. 2006) leisten muss.

GDA++ ist freie Software und unterliegt der GNU General Public License GPL v3 (http://www.gnu.org/licenses/gpl.html). Das Programm kann auf Anfrage vom Autor bezogen werden.

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First record of a Hauterivian-Barremian ammonite species (*Phyllopachyceras* sp. aff. *infundibulum*) from the Rossfeld Formation of Mount Hochreith (Weitenau, central Northern Calcareous Alps, Salzburg)

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From Mount Hochreith, east of Golling, at the northwestern margin of the Weitenau syncline, different cherty limestones occur. These cherty limestones were summarized by Plöchinger (1977) as Hochreith beds (= Lower Rossfeld Formation). The type-locality of the Hochreith Formation was revised by Krische et al. (2008) and Krische & Gawlick (this volume). Radiolarians of the cherty, bioturbated limestones indicate a Late Kimmeridgian to Early Tithonian age. Similar cherty limestones occur north of the type locality with a different dipping. In this series, at the northern slope of Mount Hochreith the first Hauterivian-Barremian ammonite was found in cherty limestones. The ammonite *Phyllopachyceras* sp. aff. *infundibulum* is palaentologically and stratigraphically described (Abb. 1).

The systematics of Ammonoidea follows the system of Wright et al. (1996) with the subsequent emendation of Murphy & Rodda (2006) and the modification of the International Code of Zoological Nomenclature Art. 29.2.

Class CEPHALOPODA Cuvier, 1797
Order AMMONOIDEA Zittel, 1884
Suborder PHYLLOCERATINA Arkell, 1950
Superfamily PHYLLOCERATOIDEA Zittel, 1884
Family PHYLLOCERATIDAE Zittel, 1884
Subfamily PHYLLOPACHYCERATINAE Collignon, 1937

Genus *Phyllopachyceras* Spath, 1927

Phyllopachyceras sp. aff. *infundibulum* (d’Orbigny, 1841)

1841 *Ammonites infundibulum* d'Orbigny - d'Orbigny p. 131, Pl. 39. figs. 3-4.
1956 *Phyllopachyceras infundibulum* Orbigny - Drushchitz p. 123, Pl. 12. figs. 44-46.
1960 *Phyllopachyceras infundibulum* Orbigny - Drushchitz & Kudryavtzev p. 252, Pl. 3. figs. 2-3.
1977 *Partschiceras infundibulum* (d'Orbigny) - Myczynski p. 149, Pl. 8. fig. 5.
1996 *Phyllopachiceras infundibulum* (d'Orb.) - Faraoni et al. p. 253, Pl. 3. fig. 8.
1999 *Phyllopachyceras* cf. *infundibulum* (d'Orbigny) - Vasicek & Faupl Pl. 4. fig. 9.
2004a *Phyllopachyceras infundibulum* (d'Orbigny) - Lukeneder p. 38, Pl. 1. fig. 2.
2004b *Phyllopachyceras infundibulum* (d'Orbigny) - Lukeneder Pl. 1. fig. 12.
2005 *Phyllopachyceras infundibulum* (d'Orbigny) - Topchishvili p. 286, Pl. 46. fig. 1.g.
2006 *Phyllopachyceras infundibulum* (d'Orbigny) - Murphy & Rodda p. 57, Pl. 7. figs. 2-5, Pl. 8. figs. 1-8.
2006 *Phyllopachyceras infundibulum* (d'Orbigny) - Lukeneder & Aspmair Pl. 2. figs. 1-2.
2006 *Phyllopachyceras infundibulum* (d'Orbigny) - Fözy & Janssen p. 43, fig. 3B.
2008 *Phyllopachyceras infundibulum* - Lukeneder Pl. 1. figs. 3-4.
2009 *Phyllopachyceras infundibulum* (d'Orbigny) - Matsukawa & Fukui figs. 4 A-C, E, F.
2009 *Phyllopachyceras infundibulum* (d'Orbigny) - Vasicek et al. p. 132, figs. 3.1, 3.2.

The material is only one badly preserved internal mould with following Dimensions: D = (55) mm, Wh = (28) mm, Wb = - , U = (10) mm.

Description: It represents one poorly preserved and crushed lateral fragment of an adult specimen. Typical phylloceratid ammonite coiled with shallow and narrow umbilicus. At the umbilical shoulder strong, and slightly prorsiradiate ribs rise, which probably cross the venter continuously. Due to the crashed status of the fragment the venter is not observed. Primary ribs are rounded. At the midflank or ventrolaterally, intercalatory ribs appear which expand rapidly to the same shape, and thickness than the primary ribs. Close to the venter, and on the dorsolateral flank the primary and secondary ribs are equal, and probably cross the venter continuously. Secondary ribs are regularly spaced between the primary ribs: always one secondary rib appear between the primary ribs. Cross section is not observable, however due to the crushed lateral part it is supposed to be slightly inflated and oval typical for *Phyllopachyceras*. Suture line is not visible.

Remarks: The specimen shows similarities towards *Ph. beneckei*, *Ph. infundibulum*, *Ph. prendeli*, and *Ph. winkleri*. Regarding *Ph. beneckei*, its ribbing is denser and less strong than *Ph. infundibulum*, and secondary ribs are placed irregularly, namely between the primary ribs, sometimes two or even three secondary ribs occur. Regarding the *Ph. prendeli*, the primary ribs are slightly flexuous at the dorsolateral flank, which cannot be observed here. However, secondary ribs of *Ph. prendeli* also appear at midflank or ventrolaterally, but very slowly develop on the midflank and ventrolateral flank. Regarding *Ph. winkleri*, its ribbing is also regular, but rise at midflank, which cannot be observed at the present specimen. Taking into consideration the observed features of the present specimen, it is most similar to *Ph. infundibulum* of d'Orbigny (1841, Pl. 39 figs. 3-4), however important features as the cross section, the venter, the complete coiling is not preserved, therefore the open naming is established.

Occurrence: *Ph. infundibulum* is well known from the Late Valanginian-Late Barremian of Tethyan Realm, and abundant in the Mediterranean Faunal Province, however it is reported from other provinces, too. It is reported from the Late Hauterivian-Early Barremian of Oregon and California, USA; the Lower Cretaceous of Sierra del Rosario, Western Cuba; the Late Hauterivian-Barremian of Betic Cordilleras, SE Spain; latest Hauterivian of the Lessini Mts, Verona, Italy; the Late Hauterivian - Early Barremian of Mount Schneeberg, Northern Calcareous Alps, Austria; the Late Hauterivian of the Bakony Mts., Transdanubian Range, Hungary; the Hauterivian of Stara Planina, Eastern Serbia; the Barremian of Simferopol, Crimea, Ucraina; and finally the Hauterivian-Barremian of Hida-Furukawa region, Japan. The very badly preserved, crushed and fragmented internal mould refers to *Ph. infundibulum*, which is typical for the Mediterranean Province of the Tethyan Realm where it is abundant, and also refers to bathyal water depth. Stratigraphically it ranges from the Latest Valanginian to the Latest Barremian; however it is more typical for the Late Hauterivian-Barremian.

Conclusion: This result shows clearly, that mapping only on the basis of litho- and in this case also by microfacies characteristics is not possible without biostratigraphic control. Lithologically the Late Jurassic (Late Kimmeridgian to Early Tithonian) cherty limestones of the Hochreith Formation are very similar to those Hauterivian-Barremian cherty limestones of the Early Cretaceous (?Late Valanginian to Hauterivian) Rossfeld Formation, but the age is completely different. Therefore both sequences are here clearly separated by a tectonic line, so far unknown in its character. This result clearly illustrates now that the Mount Hochreith is built up of cherty limestones of different age (Plöchinger 1977, Krische et al. 2008, Krische & Gawlick this volume) showing a complex tectonic structure and not only a simple Early Cretaceous basin fill. More detailed stratigraphical information (ammonites, radiolaria) is needed to get a clearer picture about the geological characteristics of this mountain and to reconstruct the geodynamic history of the western part of the Weitenau area.

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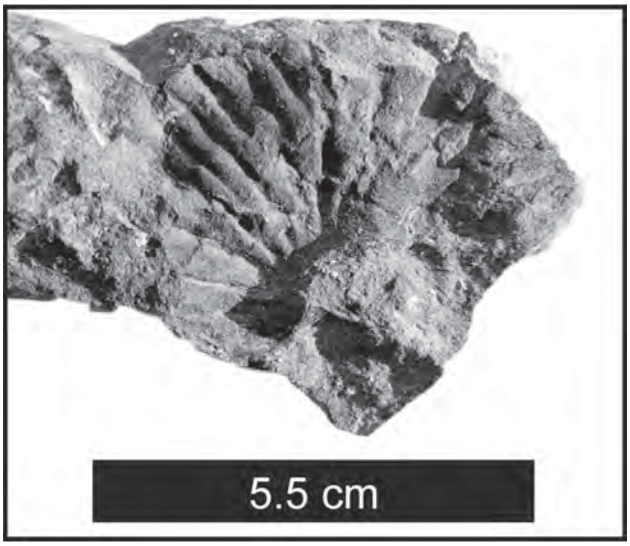

Abb. 1: *Phyllopachyceras* sp. aff. *infundibulum* from the Rossfeld Formation of Mount Hochreith (Weitenau, central Northern Calcareous Alps, Salzburg).

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Stable isotope analysis of Palaeo-Lake ostracods (Lake Pannon/Central Europe & Lake Pebas/ Western Amazonia; Middle-Late Miocene)

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Analysis of the stable isotopes (i.e. $\delta^{18}O$, $\delta^{13}C$), applied to bulk sediment samples or isolated fossils has become a standard procedure in palaeoclimatological and palaeoenvironmental studies. Oxygen isotopes can provide information about water temperature, precipitation/ evaporation ratio and about the chemical composition of the ambient water. Several parameters like salinity or even disequilibrium/vital effects might influence the recorded $\delta^{18}O$ values significantly. In lakes $\delta^{13}C$-records depend on factors like temperature and water chemistry but also on photosynthesis of aquatic plants and hence on seasonal productivity. Atmospheric and lake water fluxes might further affect $\delta^{13}C$-values (Leng & Marshall 2004).
The analysis of stable isotope composition of ostracod valves has several advantages, for instance compared to molluscs: 1. they can be easily separated from the sediment; 2. their low-Mg-calcite valves are commonly well-preserved; 3. they occur in a wide range of salinity (hyperhaline to freshwater); 4. ostracods take up calcium carbonate and some trace elements directly from the ambient water (Turpen & Angell 1971) and thus reflect environmental characteristics in which they grew well; 5. they molt several times before reaching the adult stage. Formation of a new valve takes place within a short period of time (less than 24 hours) and therefore reflects a very discrete palaeoenvironmental condition. However, a critical point is the basics of sample treatment in order to avoid analytical „noise“. Based on an in-depth review of the relevant literature as well as on own test series, we developed a „standard“-procedure for isotopic analysis of fossil ostracods.
Within the frame of an Austrian-Brazilian cooperation project the analysis of stable isotopes contribute palaeo-