

1. Introduction

1.1. Summary of previous research

The first discoveries of Permo-Carboniferous acanthodians in the region of the Czech Republic were mentioned by GEINITZ (1861, p. 21). He noted *Acanthodes gracilis* from Rudník (Herrmannsseifen in the German transcription) in the Krkonoše Piedmont Basin (for the geographic position of limnic basins see Fig. 1; for the stratigraphic table see Fig. 2).

The earliest Carboniferous acanthodians were originally described by FRIČ (1875; 1877) as *Acanthodes pygmaeus* from the Plzeň Basin (Nýřany Member; Westphalian D). He jointed this species to the new genus *Traquairia*, erected the new genus and species *Protacanthodes pinnatus* and described thoroughly both species in his extensive monograph (FRITSCH 1893). Prof. Antonín Frič often used the German transcription of his name – Anton Fritsch. The generic names as younger homonyms were later replaced by *Traquairichthys* WHITLEY, 1933 and *Pseudacanthodes* WHITE & MOY-THOMAS, 1941. The first species was also reported by AUGUSTA (1939a) as *Traquairia pygmaea* and by JENSEN (1975) as *Traquairichthys pygmaeus*.

Disarticulated acanthodian remains (namely scales and fin spines) are relatively common in various sediments of Stephanian B (Slaný Formation) of the Plzeň Basin and the Central Bohemian Basins. FRIČ (1875; 1877) described these remains originally as *Acanthodes* sp., later FRITSCH (1893) named two partially articulated specimens from the locality Žilov (Malesice Member) as *Acanthodes ?bronni* and two isolated fin spines from the Kounov Member as *Acanthodes punctatus*. However, the latter name is inapplicable as a nomen dubium (ZIDEK 1976 and ZAJÍC 1985b; 1988c).

Acanthodian remains from this stratigraphic level were more detailed described by FRIČ (1912 and above mentioned papers), ŠIMÚNEK & ZAJÍC (1984) and ZAJÍC (1981; 1985a; 1985b; 1986a; 1986b; 1987; 1988a; 1988b; 1995). ZIDEK (1973; 1976) mentioned scales of *Traquairichthys* sp. from the Kounov Member but according to my knowledge these scales belong most probably to *Acanthodes fritschi* n. sp. or to *Acanthodes* sp. (see chapter 2). On the other hand, I have discovered incorrect localizations (or replacement of labels) in five specimens of *Traquairichthys pygmaeus* in the collection of the National Museum, Prague. These specimens are doubtless preserved in sediment belonging to the Nýřany Member and not to the Kounov Member.

Very fragmentary acanthodian material known from the age of Stephanian C was first mentioned by FRIČ (1912) and later by ŠIMÚNEK, ZAJÍC & DRÁBKOVÁ (1989) and ZAJÍC (1988a; 1989; 1991).

Specimens of *Acanthodes gracilis* from Lowermost Permian of the Krkonoše Piedmont Basin (Vrchlabí Formation, Rudník Horizon) and the Boskovice Furrow are mentioned by AUGUSTA (1925; 1931; 1939b; 1946; 1947),

DANĚK (1902), FRIČ (1912), FRITSCH (1893), GEINITZ (1861), HAVLENA & ŠPINAR (1954), MAKOWSKY & RZEHAK (1884), RZEHAK (1881), ŠIMÚNEK, ZAJÍC & DRÁBKOVÁ (1990), ZAJÍC (1986d; 1988c; 1989), ZAJÍC, MARTÍNEK, ŠIMÚNEK & DRÁBKOVÁ (1996) and others. The subspecies *Acanthodes gracilis bendai* from the Boskovice Furrow and Krkonoše Piedmont Basin was erected by FRITSCH (1893) on the basis of different sculpture of scale crowns. Its validity is not sustained up to this time. RZEHAK (1881) mentioned another subspecific name – *Acanthodes gracilis micracanthus* from the Boskovice Furrow. This name is, however, a nomen nudum. The stratigraphically youngest find of the genus *Acanthodes* from the Bohemian and Moravian limnic basins was mentioned by FRIČ (1912) from the Olivětín Member of the Intra-Sudetic Basin. The specimen is, however, extremely doubtful because it was lost before the publication of FRIČ's paper (1912) and no other specimen was found in the same stratigraphic level. There is most probably a mistake (wrong locality or determination).

Bohemian and Moravian acanthodian remains were previously summarized by ZAJÍC (1993) and by ZAJÍC & ŠTAMBERG (1986).

1.2. Stratigraphy and fossil material

The following two regions of the limnic Permo-Carboniferous of Czech Republic yield Stephanian acanthodians:

1. Western and Central Bohemian region (the Plzeň, Rakovník, Kladno, Roudnice, and Mšeno Basins).
2. Sudetic region (the Mnichovo Hradiště and Krkonoše Piedmont Basins).

The fossil material is deposited in the collections of National Museum, Prague (M), Paleontological Department of the Charles University, Prague (P), and the Czech Geological Survey, Prague (JZ, and YA).

For the stratigraphic positions of Stephanian acanthodians see Fig. 2. The correlation between the lithostratigraphic units of the Central and Western Bohemian Basins and the Krkonoše Piedmont Basin is based on SKOČEK (1990). He correlates the Black Shale Horizon of the Syřenov Formation with the Mšec Member which is in harmony with biostratigraphic data (ZAJÍC 1990).

The list of localities and boreholes with all known finds of *Acanthodes* is arranged according to the lithostratigraphic units and basins. The full name of borehole, the number of relevant map (1 : 25 000), and a reference (for finds which were not at my disposal) are in parentheses.

* Jelenice Member (isolated remains only)

– Kladno Basin

Sa-21 borehole (Slaný; 12-213)

– Roudnice Basin

Lib-1 borehole (Liběchov; 02-443)

* Mšec Member (abundant isolated remains, occasional partially articulated specimens)

– Plzeň Basin

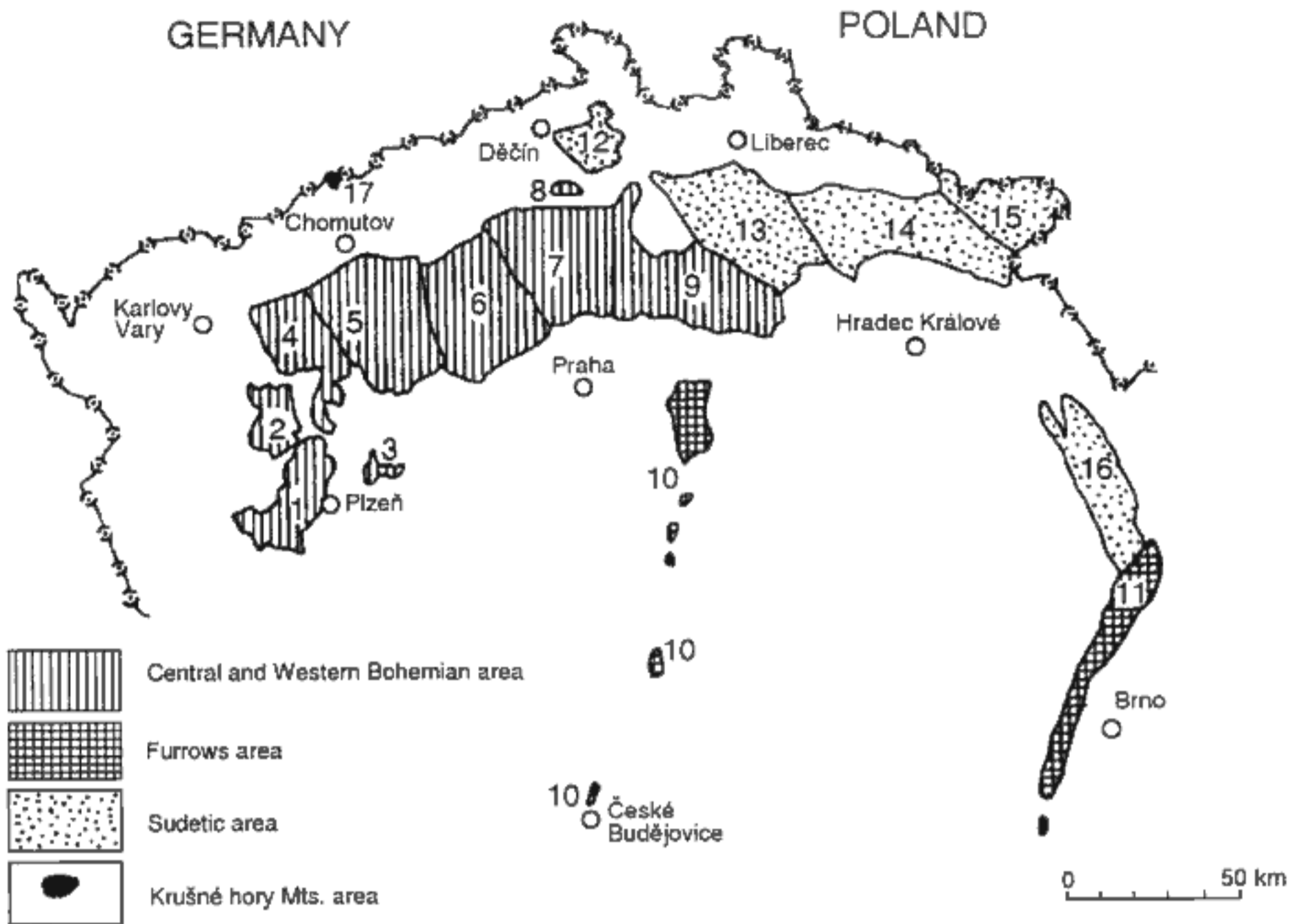


Fig. 1. The uncovered map of the limnic Permo-Carboniferous basins of Czech Republic: 1 – Plzeň Basin, 2 – Manětín Basin, 3 – Radnice Basin, 4 – Žihle Basin, 5 – Rakovník Basin, 6 – Kladno Basin, 7 – Roudnice Basin, 8 – Kravaře Basin, 9 – Mšeno Basin, 10 – Blanice Furrow, 11 – Boskovice Furrow, 12 – Česká Kamenice Basin, 13 – Mnichovo Hradiště Basin, 14 – Krkonoše Piedmont Basin, 15 – Intra-Sudetic Basin, 16 – Orlice Basin, 17 – Brandov Basin.

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|--|---|
| Malesice (11-444; FRITSCH 1893) | Sš-1 borehole (Sušno; 13-111) |
| Žilov (11-442) | – Mnichovo Hradiště Basin |
| – Rakovník Basin | DB-1 borehole (Dolní Bousov; 03-343) |
| Hředle (12-141; FRITSCH 1893) | Sč-1 borehole (Semčice; 13-121) |
| Kněžves (12-132; FRITSCH 1893) | * Kounov Member (abundant isolated remains, sporadic partially articulated specimens) |
| Krupá (12-141; FRITSCH 1893) | – Rakovník Basin |
| – Kladno Basin | – Kounov (12-141) |
| Dch-3, 4 boreholes (Drchkov; 12-213) | Kroučová (12-141; FRIČ 1877) |
| Hš-1 borehole (Hobšovice; 12-214) | – Kladno Basin |
| Ke-5, 6, 7 boreholes (Kralovice; 12-213) | Bdín (12-142; OBRHEL & MALICH 1957) |
| Lo-6 borehole (Lotouš; 12-213) | Hvězda (12-124; FRITSCH 1893) |
| Mš-2 borehole (Mšec; 12-142; OBRHEL 1958) | Jedomělice (12-124) |
| Mt-1 borehole (Martiněves; 12-211) | Přerubnice (12-124; OBRHEL & MALICH 1957) |
| Nb-5 borehole (Neprobylice; 12-213) | Srbeč (12-124) |
| Ob-5 borehole (Otruby; 12-213) | Záboř (= Jedomělice) |
| Ři-20, 21, 22, 24, 25, 26, 30 boreholes (Řisuty; 12-213) | * Zdětín Horizon (isolated remains) |
| Sa-2a, 21 boreholes (Slaný; 12-213) | – Kladno Basin |
| Slaný (12-213) | Mt-1 borehole (Martiněves; 12-211) |
| – Roudnice Basin | – Roudnice Basin |
| Lib-1 borehole (Liběchov; 02-443) | Lib-1 borehole (Liběchov; 02-443) |
| Str-1 borehole (Strachalý; 02-441) | – Mšeno Basin |
| – Mšeno Basin | Bc-1 borehole (Brodce; 13-112) |
| Bc-1 borehole (Brodce; 13-112) | Bš-3 borehole (Byšice; 12-222) |
| Bš-3 borehole (Byšice; 12-222) | Kbl-2 borehole (Kbel; 13-114) |
| Kbl-2 borehole (Kbel; 13-114) | Krp-1 borehole (Krpy; 13-111) |
| Krp-1 borehole (Krpy; 13-111) | Lbl-1 borehole (Liblice; 12-222) |
| Lbl-1 borehole (Liblice; 12-222) | MV-1, 2 boreholes (Mělnické Vtelno; 13-111) |
| MV-1, 2 boreholes (Mělnické Vtelno; 13-111) | |

Age	Acme-zones (ZAJÍC 1990)	Central and Western Bohemian Basins (HOLUB & PEŠEK 1991)		<i>Acanthodes fritschi</i> n. sp.	<i>Acanthodes</i> sp.	Krkonoše Piedmont Basin (HOLUB & PEŠEK 1991)		<i>Acanthodes</i> sp.	
		Formation	Member			Formation	Member		
Stephanian C		Líně				Semily	Upper		
							Middle		+
							Lower		
Stephanian B	<i>Sphaerolepis</i>	Slaný	Kamenný Most			Syřenov	Upper		
			Kounov						Otruby
			Ledce						
	<i>Watsonichthys</i>		Hředle						Malesice
			Mšec						
			Jelenice						

Fig. 2. Lithostratigraphic table of the Central and Western Bohemian region and Krkonoše Piedmont Basin with the subzones (acme-zones) of the *Sphaerolepis*-*Watsonichthys* range-zone and with acanthodian occurrence. The suits indicate important fossiliferous horizons: ♥ – Zdětín Horizon, ♦ – Klobuky Horizon, ♣ – Black Shale Horizon, + – Ploužnice and Štěpanice-Čikvásky Horizons. For biostratigraphic details see chapter 4.

* Klobuky Horizon (isolated remains)

Klobuky (12-213)
Páleček (12-213; OBRHEL 1959)
Peruc (12-122)

* Ploužnice Horizon (isolated remains)

– Krkonoše Piedmont Basin
HK-1 borehole (Horní Kalná; 03-414)
Ploužnice (03-431)

* Štěpanice-Čikvásky Horizon (isolated remains)

– Krkonoše Piedmont Basin
Dolní Štěpanice (03-414; HOLUB 1961)
Nedvězí (03-413)

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2. DESCRIPTION

2.1. Index of abbreviations

a – zone without canals
ag – anterior groove of the pectoral fin spine
alb – axial lobe of the caudal fin
art. cs – articular cotylus
asp – anal fin spine
b – zone of canals oblique to the longitudinal axis of spine
ba – scale base
bra – branchial arch
c – “pith” cavity zone
can – canal
cno – circumorbital bones
c. pi – “pith” cavity
cr – scale crown
crh – ceratohyal
d – zone of canals running parallel with the longitudinal spine axis
dmt – dermatichia