Summarised description

Unit name

Mirwart Formation

Code

MIR

Status

Formal Formation

Parent unit

Warche Group

Child units

Alle Member, Anlier Facies

Characteristic description

Greenish, bluish or beige quartzite, quartzitic sandstone occurring in metre- to plurimetre-thick beds, commonly lenticular and limited by undulating surfaces, alternating with siltstone and shale. The sandstone displays abundant sedimentary structures. Locally, shaly and slaty lithologies are dominant.

Age

Lochkovian to Pragian

Thickness

300 to 2000 metres

Area of occurrence

Southern and south-eastern margin of the Dinant Synclinorium, Ardenne Anticlinorium, Neufchâteau-Eifel Synclinorium.

Type locality

Sections along the Namur–Arlon railway near Mirwart.

Alternative names

Grès d'Anor, Schistes et Quartzites de Nouzon, Schistes de Tournay, formations de Morhet et de Verlaine, Monshau-Schishten

Authors

Forir (1900)

Modified after

Denayer, J. & Mottequin, B., 2024. Lower Devonian lithostratigraphy of Belgium. Geologica Belgica, 27/3-4, 115–154.

Date

23/09/2025

Cite as

Denayer, J. & Mottequin, B., 2025. The Mirwart Formation, 23/09/2025. National Commission for Stratigraphy Belgium. https://ncs.naturalsciences.be/lithostratigraphy/Mirwart-Formation

Full description

Unit name

Mirwart Formation

Code

MIR

Status

Formal Formation

Parent unit

Warche Group

Child units

Alle Member, Anlier Facies

Origin of the name

After the village of Mirwart in the Lomme River valley.

Alternative names

Grès d'Anor, Schistes et Quartzites de Nouzon, Schistes de Tournay, formations de Morhet et de Verlaine, Monshau-Schishten

Authors

Forir (1900): *Schistes, grauwacke et grès de Mirwart*

Modified after

Denayer, J. & Mottequin, B., 2024. Lower Devonian lithostratigraphy of Belgium. Geologica Belgica, 27/3-4, 115–154.

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Characteristic description

The Mirwart Formation is an assemblage of quartzite, quartzitic sandstone, siltstone and shale of various colours. The sandstone and quartzite are greenish, bluish or beige in colour and occur in metre- to plurimetre-thick beds, commonly lenticular and limited by undulating surfaces. They usually display parallel, oblique or cross stratifications, wavy lenticular bedding, flaser bedding, shale chips, basal erosion and other sedimentary structures (Goemaere & Dejonghe, 2005). The shale and siltstone are darker in colour, bluish grey to black. In the Ardenne Anticlinorium, the sandstone facies dominates over the shaly one but eastwards (La Roche Syncline and eastwards), the sandstone beds tend to appear in metre- to plurimetre-thick bundles separated by thicker packages of shale, siltstone and slate, often laminar (*quartzophyllade*). Rare carbonate sandstone intercalations occur sporadically. Similarly, southwards, the slaty and shaly facies dominate and the sandstone beds form scarce isolated bars. Along the southern limb of the Neufchâteau–Eifel Synclinorium, the Formation is represented by homogenous *quartzophyllades* with few metre-thick intercalations of greenish-grey sandstone with oblique stratifications (mostly restricted to the lower part of the Formation). Along

the northern limb of the Neufchâteau–Eifel Synclinorium, the Formation is made of two units dominated by slaty facies, separated by a third unit richer in sandstones and quartzitic sandstone. The first two units were named *formations de Morhet et de Verlaine* by Beugnies (1985) but the impossibility to distinguish them in most places make these two terms obsolete.

In the upper part of the Formation, the **Alle Member** (*phyllades d'Alle* in Gosselet, 1888, p. 288) can be individualised. It consists of a unit of dark slate with a tight cleavage and thin quartzitic laminae capped by a horizon with chloritised plant debris (dominantly *Taeniocrada decheniana*). This unit has been quarried for roof tiles in the Semois River valley (Laforêt, Frahan, Alle, etc.) where three c. 10 m thick slate horizons, namely *couche de Laspote*, *couche de Hour* and *couche de Laviot*, are separated by 5 to 50 m thick packages of sandy slate and quartzite (Asselberghs, 1924).

Although the Mirwart Formation has been mapped throughout the Ardenne, it is clear that there are two distinct facies: a northern one corresponding to the classical definition of the Mirwart Formation and a southern, where the fine-grained lithology largely dominates upon the sandstones. This last facies is referred as the **Anlier Facies** (*facies d'Anlier* in Asselberghs, 1927, p. 212; 1932, p. 23; 1946, p. 111; *quartzites et phyllades* (…) *d'Anlier* in Maillieux, 1940, p. 9; Asselberghs, 1946, p. 17; also named *Schistes de Tournay* in Gosselet, 1888, p. 302) that is individualised to the south of a line joining Libramont to Bastogne. Southwards, this unit is clearly different from the Mirwart Formation but the lack of good sections precludes the definition of a potential Anlier Formation.

In the metamorphic zones (Bastogne, Bertrix), the slate is enriched in ilmenite, biotite and garnets and form a very compact rock without cleavage, known in the literature as *cornéite* (Stainier, 1907).

Area of occurrence

Southern and south-eastern margin of the Dinant Synclinorium, Ardenne Anticlinorium, Neufchâteau-Eifel Synclinorium. In the Neufchâteau Synclinorium, the southern fine-grained slaty facies (Anlier Facies) dominates. The Alle Member exists on both flanks of the Neufchâteau–Eifel Synclinorium but is particularly well expressed along the southern one.

Type locality

Sections along the Namur–Arlon railway near Mirwart. The Formation is well exposed in the Lambert (Flamierge) and the Collignon (Bastogne) quarries where the sandstone beds display the typical boudinage as firstly defined by Lohest (1909).

Age

A diachronous Lochkovian to Pragian age is proposed by Steemans (1989) from the east and south (Mirwart and Chiny: Lochkovian Z to Pragian W zones) to the west (Couvin: Pragian Paα Zone).

Thickness

It is particularly variable: 300 m south of Couvin (Marion & Barchy, 1999), 600 m between Mirwart and La Roche-en-Ardenne (Blockmans et al., 2019), 1000 m west of Dochamps (Dejonghe & Hance, 2001), up to 2000 m in Bertrix and Bouillon (Belanger & Ghysel, 2017). The Alle Member is 100–150 m thick in most areas. The Alle Member is c. 85 m thick in the Semois River valley (Belanger & Ghysel, 2017).

Lower boundary

First thick bed of greenish or bluish quartzitic sandstone or siltstone with parallel or oblique stratification.

Upper boundary

First thick bed of calcareous siltstone or shale of the overlying Villé Formation.

Regional correlations

The Mirwart Formation corresponds to the former *Grès d'Anor* formation introduced by Hébert (1855, p. 1172). However, the lack of a proper section in the Anor area and the duplication of the whitish quartzitic beds (*faciès anoreux* in the literature related to the Lower Devonian formations) have justified the abandon of this denomination (Stainier, 1994). This unit passes westwards to the *Schistes et Quartzites de Nouzon* (Beugnies & Waterlot, 1965) in France and eastwards to the *Monschau-Schichten* (Brühl, 1966; Ribbert et al., 1992) in Germany.

The northern facies dominated by the sandstones occur along the southern and south-eastern margin of the Dinant Synclinorium up to the Mormont Fault, where it passes to the Bois d'Ausse Formation.

This formation is recognised within the Ardenne Anticlinorium up to La Roche-en-Ardenne where it passes progressively eastwards to a more shaly and slaty facies that is difficult to distinguish from the overlying Longlier and Kautenbach–Troisvierges formations and is included in the Warche Group. The transition from the Anlier Facies to the quartzitic one is very transitional and located imprecisely along the southern limb of the Ardenne Anticlinorium.

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