



Tethysian, Tethyan or ... Tethys Ocean and Tethys

As an editor, reviewer and author in Earth sciences I have faced more than once the tricky problem of using the appropriate qualifier for the Tethys (or derived paleogeographic entities: the Neo-tethys, the Paratethys, the Ceno-Tethys, Meso-Tethys, the Paleo-Tethys, the Proto-Tethys) in the English language. Would it be Tethysian, Tethyan, or simply Tethys (*i.e.*, no customized qualifier)? Tethyan is rather popular among Anglo-Saxon authors but, recently, the alternative use of Tethysian has gradually increased, possibly due to the influence of authors whose native languages are Latin-derived. However, both could be wrong because, as it will be reminded hereafter, Tethys can stand alone and does not need a qualifier in the English language. Nevertheless, other languages, mostly Latin-derived languages (*e.g.*, French, Portuguese, Romanian, or Spanish - excluding the singular case of the Italian language -), may require a qualifier (Table 1) and, additionally, taxonomy may use "-tethy-" or "-tethys-" as stems for new names.

To get back to where the problem started, one needs to go back to the source. In an Anglo-American journal of scientific popularization published from 1892 to 1899, SUESS (1893) introduced the qualifier (adjective) "Tethyan" to name an ocean once spanning from West to East between the continents of Gondwana and Laurasia.

There are two options here:

1) either following the Mediterranean template, one could refer either to the Tethyan Sea or to the Tethyan (Table 2),

2) or following the 'Norwegian Sea' template, one should only refer to the Tethyan Sea (Table 2), with Tethyan as a qualifier (*e.g.*, the Tethyan history).

In any case, this sea is indeed not called the Tethys (in blatant contradiction with SUESS' own statement: "This ocean we designate by the name "Tethys," ..."). In later publications (Table 2), notably in "Das Antlitz der Erde" (SUESS, 1901), in its French extended translation (SUESS, 1902) and its English translation (SUESS, 1908), this error - possibly due to an editor, a language editor or a translator - was corrected because the term Tethys always appears as a stand-alone word, never coming as a qualifier (Table 3).

Although the use of an adjective is not mandatory in the English language, introducing new names in taxonomy (*e.g.*, adjectival epithets for species, names of genera, and names of taxa above the rank of genus) may require a clarification. The Greek name of the goddess Τηθύς is composed from the root Τηθύ-, transcribed as **Tethy-**, and the nominative termination -ς (final s).

Table 1:

lang.	noun	alternative names	qualifier/ adjective	examples
(DE)	(der) Tethys	das Tethys meer, das Tethys see	[not provided, non-mandatory]	das Tethys fauna, das tethys chen Ammoniten
(FR)	(la) Téthys	l'océan Téthys (common), l'océan de Téthys (rare)	téthysien / téthysienne	la faune téthysienne
(PT)	(o) Tétis	o mar Tétis , o mar de Tétis	tétisiano/ tétisiana	as influências tétisianas
(RO)	Tethys	Oceanul Tethys , Marea Tethys	tethysian (masculine)/ tethysiana (feminine)/ tethysiene (plural)	domeniu tethysian , domenii tethysiene
(SP)	(el) Tetis	el océano Tetis , el océano de Tetis , el mar Tetis , el mar de Tetis	tetisiano/ tetisiana	la transgresión tetisiana

Therefore, correct derivatives based on her name should use the stem **-tethy-** preceded by a prefix or followed by a suffix. In the same vein, **Tethys**, the full modern German or English name of the eponymic paleogeographic entity, could be used as the stem of related derivatives.

A number of taxa the valid names of which refer to Τηθύς have been described long before the **Tethys** Ocean, was defined by SUESS. The first of these taxa is the genus **Tethys** LINNAEUS, 1767, from which derives the family name **Tethy**idae RAFINESQUE, 1815. There are also a number of species having "tethys" in full as specific epithet, *i.e.*, as a noun in apposition (*i.e.*, *Phylloceras* (*Hypophylloceras*) **tethys** (ORBIGNY, 1841); *Lavignon* **tethys** ORBIGNY, 1850; *Oceanodroma* **tethys** (BONAPARTE, 1852); *Bembidion* (*Phyla*) **tethys** NETOLITZKY, 1926; *Halobates* (*Halobates*) **tethys** HERRING, 1961; *Kallichroma* **tethys** (J. KOHLMAYER & E. KOHLMAYER, 1965); *Molgula* **tethys** F. MONNIOT & C. MONNIOT, 1974; *Callionymus* **tethys** FRICKE, 1993; *Prunum* **tethys** LUSSI & SMITH, 1999; *Conus* **tethys** (PETUCH & SARGENT, 2011); *Phyllocnistis* **tethys** MOREIRA & VARGAS, 2012; *Brockmanniella* **tethys** ÁLVAREZ-BLANCO & BLANCO, 2014).

As discussed above, **-tethy-** is therefore the correct stem for names deriving from the Greek name of the goddess Τηθύς (but it also appears as the root for misspelled names deriving from the **Tethys** Ocean). Changing prefixes or suffixes or both have led to:

1) numerous genera of Demospongia starting with **Tethya** LAMARCK, 1815, from which derives the name of the Family **Tethy**idae GRAY, 1848



Table 2:

author, date	noun	qualifier/ adjective	examples
SUESS, 1893 (EN)	(the) Tethyan ⁽¹⁾ (?) or (the) Tethyan Sea ⁽²⁾	Tethyan	the Tethyan Sea (p. 183), the Tethyan Ocean (p. 184), the Tethyan history (p. 184-185)
SUESS, 1895 (FR)	(la) Tethys	Téthydien/ Téthydienne	la communication Téthydienne (p. 1116)
SUESS, 1901 (DE)	(der) Tethys	[none provided, non-mandatory]	der Tethys (p. 25)
SUESS, 1902 (FR)	(la) Téthys	[none provided]	la Téthys (p. 27)
SUESS, 1908 (EN)	(the) Tethys	[none provided, non-mandatory]	the Tethys (p. 29)

Table 3:

noun	qualifier/ adjective	examples
(the) Atlantic	Atlantic	the Atlantic Ocean, the Atlantic history
(the) Barents Sea	[none available, non-mandatory]	the Barents Sea, the history of the Barents Sea
(the) Norwegian Sea	Norwegian	the Norwegian Sea, the history of the Norwegian Sea
(the) Mediterranean	Mediterranean	the Mediterranean Sea, the Mediterranean history
(the) Tethys	[none provided, non-mandatory]	the Tethys Sea, the Tethys Ocean, the Tethys history

(which comprises *Anthotethya* M. SARÀ & A. SARÀ, 2002, *Burtonitethya* SARÀ, 1994, *Laxotethya* M. SARÀ & A. SARÀ, 2002, *Nucleotethya* M. SARÀ & BAVESTRELLO, 1996, *Oxytethya* M. SARÀ & A. SARÀ, 2002, *Stellitethya* M. SARÀ, 1994, *Tectitethya* M. SARÀ, 1994, *Tethyastra* M. SARÀ in HOOPER & SOEST, 2002, and *Tethycometes* M. SARÀ, 1994), as well as two other genera of Demospongia, i.e., *Tethyspira* TOPSENT, 1890, *Tethytimea* LAUBENFELS, 1936, and *Eolipastrotethya* ŁUKOWIAK & PISERA, 2016;

2) various genera from other animal, fungal or phycological groups (i.e., *Tethyopsis* STEWART, 1870; *Tethygeneia* BARNARD, 1972; *Tethylembos* MYERS, 1988; *Tethyaster* SLADEN, 1889; *Tethyrhynchia* LOGAN in LOGAN & ZIBROWIUS, 1994, from which derives the family name *Tethyrhynchiidae* LOGAN in LOGAN & ZIBROWIUS, 1994; *Tethysaurus* BARDET *et al.*, 2003; *Tethygonium* JUST & WILSON, 2007; *Tethydraco* LONGRICH *et al.*, 2018; *Tethymyxine* MIYASHITA *et al.*, 2019), as well as the Clade *Tethytheria* MC KENNA, 1995;

3) numerous species (i.e., *Craniella tethyoides* SCHMIDT, 1870; *Loxosomella tethyae* (SALENSKY, 1877); *Stelletta tethyopsis* CARTER, 1880; *Stelletta tethyoides* LENDENFELD, 1888; *Axinyssa tethyoides* KIRKPATRICK, 1903; *Lankesteria tethyi* BOGOLEPOVA, 1953; *Timea tethya* (LAUBENFELS, 1954); *Timea tethyoides* BURTON, 1959; *Trachycladus tethyoides* BURTON, 1959; *Higginsia tethyoides* LÉVI, 1960; *Colossendeis tethya* TURPAEVA, 1974; *Briggera paratethyos* ROSS & SIMS, 1985; *Ingolfiella (Tethydiella)* RUFFO & VIGNA TAGLIANTI, 1989; *Archinome tethyana* BORDA *et al.*, 2013; *Stelletta tethytimeata* CALCINAI *et al.*, 2017).

The remainder of the generic names or specific epithets refers to the Tethys Ocean. As discussed above, "-tethys-" is then the right stem for names deriving from the English name of the Tethys Ocean. Changing prefixes or suffixes or both resulted in creating:

1) some genera including the first of them, *Delavalia tethysensis* (MONARD, 1928), the suffix of which clearly points to the paleogeographic entity, but also *Tethysia* DONZE, 1975, *Tethysicodium* DRAGASTAN in TOOMEY & NITECKI, 1985, *Tethysbaena* WAGNER, 1994, *Tethysetta* DUMITRICA, 1997, *Tethysocarnia* SENOWBARI-DARYAN *et al.*, 2001, *Tethysiella* KOTLYAR *et al.*, 2004, *Tethyshadros* DALLA VECCHIA, 2009, *Tethysthrips* NEL *et al.*, 2010, *Boreotethys* PARKER, 2016, *Pseudotethysia* KARPUK *et al.*, 2019, and *Tethysphytum* K. SCIUTO *et al.*, 2021;

2) some additional species (i.e., *Trochoturbella (Proturboella) tethysiana* CONTI & FISCHER, 1982; *Heteromysis (Heteromysis) tethysiana* BĂCESCU, 1983; *Procerithium (Procerithium) tethysianum* FISCHER in FISCHER *et al.*, 2001; *Neoprincipia tethysiana* CÓZAR & VACHARD, 2003; *Pyroderces tethysella* KOSTER & SINEV, 2003; *Ciliopagurus tethysianus* BESCHIN *et al.*, 2007; *Cypraeorbis tethysianus* DOLIN & PACAUD, 2009; *Montemagrechius tethysianus* DE ANGELI & CECCON, 2015; *Eoacanthacaris tethysianus* BESCHIN *et al.*, 2016).

In conclusion, Tethys is a stand-alone modern noun, which does not require a qualifier in the English language. The use of the qualifiers Tethyan or Tethysian should be strongly discouraged. Taxa the names of which comprise the stem -tethy- are named after the Greek Goddess; those the names of which bear the stem -tethys- are named after the German (SUESS, 1901), French (SUESS, 1902) and English (SUESS, 1908) *Tethys* Ocean. There was too much confusion on these two last points.

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⁽¹⁾ following the Mediterranean template (see Table 3)

⁽²⁾ following the 'Norwegian Sea' template (see Table 3)



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