

CHUARIA circularis

Walcott 1899

Walcott 1899, p. 234, pl. 27, figs 12-13 emend Vidal and Ford 1985 p 355, 357
holotype not designated; lectotype (pl. 27, fig.) designated by Ford & Bred
1973 p 540

- 1935 *Fermoria minima* Chapman p. 115 pl. 1, figs. 1, 3
 - 1935 *Fermoria granulosa* Chapman p. 116 pl. 1, figs 2 & 4 pl. 2, fig 5
 - 1935 *Fermoria capsella* Chapman p. 117 pl. 2, figs. 3-4
 - 1935 *Protobolella jonesi* Chapman p. 117 pl. 1, figs. 5-6
 - 1936 *Fermoria minima*; Sahní, p. 446 pl. 43, figs. 1-4
 - 1957 'inorganic origin' Mirra pl. 7, figs 1-4
 - 1959 unnamed *Parceae* figs. 1-2
 - 1963 'problematica' Assereto p. 502 Fig 2 check page!
 - 1969 minute unidentifiable organisms Wade p 365 pl. 69, fig. 7
 - 1971 *Chuarua* sp Hofmann p. 24 pl. 11, figs. 5-7
 - 1977 disc-like remains type 1-6 Maithy and Shukla p 183 pl. 5, figs 35-40
 - 1941 *Chuarua wimanii* Brotzen p. 260 (based on p. 109-103, pl. 5, figs. 1-5 in Wiman 1894)
- NO *Chuarua circularis*, *Kildinella magna** & *Vindhyanella jonesi* not synonymous according to Duan 1982 p. 65-66 * but included by Sun 1987 p. 115

+ planktonic colonial filamentous algae
see SUN 1987

DUAN 1982

Walcott 1899 : Late Precambrian, Arizona USA
Vidal 1974 (p. 7, pl. 1, figs. 3-6) : Late Riphean S. Sweden
range Late Riphean

(cf) Vidal 1976 b : late Riphean E Greenland

Vidal 1979 a (p. 19-21 pl. 4, figs. 4a, b) : Late Riphean, Greenland
range Late Riphean - Vendian

Vidal & Dawer 1980 : Late Riphean - Early Vendian NW Greenland

Vidal & Knoll 1983 : Late Riphean - Vendian Greenland / Scandinavia

Vidal 1981 a (p. 23, 25, Fig 11 J-K) Late Riphean - Late Vendian N. Norway

Vidal 1981 d : Late Riphean - Late Vendian, Scandinavia / Greenland

Vidal & Siedlecka 1983 (p. 54) Late Riphean - Early Vendian, N. Norway

Vidal & Maczajdowska 1992 (Fig. 3.1) Late Riphean Sweden

Knoll 1996 (p. 69-70) : Meso - Neo Proterozoic

Khomentovsky 1986 : Vendian, Siberia

Germs Knoll & Vidal 1986 (Fig. 4f.) latest Proterozoic Namibia

Butterfield et al. 1994 (p. 32, Figs G 5-H 135-I) Neoproterozoic Spitsbergen

Yin & Sun 1994 (p. 99-100, fig 4b) Neoproterozoic, northern Anhui, China

Steiner 1994 (p. 95-101, Figs 1: 4-17, 3: 1-7, 4: 1-4, 8: 2, 9: 1-2, 11: & 12: 4-11)

1a
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synonymy in Qian, Wang, Yan 2008 p. 27 [Englul p. 122-123]

1980 *Chuarina annularis* Zheng, p. 59-60, pl. 1, figs. 3-4

1980 *Ellipsophysa axicula* Zheng, p. 60, pl. 1, figs. 5-6

1980 *Ovidiscina bagongshanica* Zheng, p. 61, pl. 1, fig. 8

1985 *Chuarina multirugosa* Duan et al. p. 70, pl. 16, fig. 3 = Duan in Duan et al.

1985 *Shouhsienia shouhsiensis* Duan et al. p. 71, pl. 16, figs. 6, 7, 11

1985 *Shouhsienia magna* Duan et al. p. 71-72, pl. 16, figs. 2 & 13

[make? names] 1984 *Shouhsienia amblyota* Zheng, Yan & Zhou tab. 3-2-2, fig. 37

↓ 1984 *Shouhsienia curymarginata* Zheng, Yan & Zhou pl. 2, fig. 1

= 1984 *Microcircula simplex* Zheng, Yan & Zhou, pl. 12, fig. 7

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further synonymy from Sun 1987 p. 115-116

1969 *Kildinella magna* Timofeev p. 124, pl. 6, figs 4, 5

1969 *Trachysphaeridium vetterni* Timofeev p. 21 pl. 6 fig 3

1977 *Tasmanites vindhyanensis* Maithy & Shukla p. 182 pl 4, fig 32-33

1979 *Nucellosphaeridium* spp. Hofman (in Hofman & Aitken)
p. 156 figs 12A-C

1979 *Shouhsienia shouhsienensis* Xing, no description pl. 12, fig. 6-7

1980 *Chuarina annularis* Zheng p. 60 pl. 1, figs 5, 6

1983 *Chuarina fermorei* Mathur p. 363-364 Fig 1B

1983 *Chuarina olavarrensis* Baldis et al. p. 78-79, pl. 1, figs R, 3, 10

NB some CHUARIA circularis records = LEIOSPHAERIDIA jacutica according to Mikhailova & Jankauskas in Jankauskas et al 1989 p. 78 colony of prokaryotes (Steiner, 1997)

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Ford & Breed 1972b (p. 17-17 pl. 1, figs. 1-6 pl. 2, figs. 1-4)
Late Riphean USA Sweden Iran India Siberia USSR

Ford & Breed 1973 (p. 539 pl. 61, figs. 1-7, pl. 62, figs. 1 & 4, pl. 63, figs. 1-4)
Late Riphean Arizona USA

a) Gussow 1973 (Figs 2A-D) ^{p. 1109-1111}: Late Precambrian Alberta Canada

Hofmann 1977 (p. 3, L figs 2a-j) ^{5, 9-10}: Late Precambrian, Utah USA

Hofmann in Hofmann & Arken 1979 (p. 157 figs. 13I (partim) K, L, M) ^{Precambrian NW Canada}

Duan 1982 (p. 59, 61, Figs. 3A-J, 5A-J, O-P):
Late Precambrian, Tianjin, Jilin Province, Liaoning Province and Anhui Province eastern China

Sun 1987 (p. 115-123 pl. 1, figs. 1-8 pl. 2, figs. 1-8, pl. 4, figs. 1-2 partim)
Late Precambrian (c. 900-700 Ma)
Huainan & Fuxian districts, North China Platform

(wimani) Eisenack 1966 (p. 52, fig. 1)

(wimani) Bratzen 1941 (p. 260)

Vidal 1976a (p. 18, figs 8-A-H): Late Riphean-Vendian southern Sweden

Xing 1979 (pl. 12, fig. 9)

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- Hofmann & Rainbird 1995 (p. 724 figures. 1: 1-6)
Neoproterozoic Arctic Canada
- Samuelsson 1997 (p. 173-174, Figs 7A-7D)
Early Neoproterozoic (Late Riphean)
Kola Peninsula Northwest Russia
- Yin and Sun 1994 (p. 99-100, Figure 4b)
Neoproterozoic (Late Riphean) Northern Anhui, China
- Vidal, Moczyłowska & Rudavskaya 1993: Late Riphean, Northern Yakutia
Siberia
(p. 390-391, 393, text-fig. 3A-D, 4B, 4D)
- Ford & Breed 1973 (p. 539-540, 542, 544, 546, pl. 61, figs 1-7
pl. 62 figs. 1-6 pl. 63 figs. 1-4)
Known from Late Precambrian (Late Riphean)
USA, Sweden, Iran, Australia, Canada, France,
Siberia, India
- Knoll & Calder 1983 (p. 492 pl. 60, fig. 9) latest Riphean Svalbard
- Knoll 1982b (pl. 2, fig. 1, pl. 4, fig. 13) late Late Riphean Svalbard
- Fu 1989 (pl. 1, fig. 1) Late Precambrian Hainan East China

* = *CRASSICORUM pendjariensis*

(?) Knoll & Swett 1985 (p. 465 pl. 51, fig. 1-2) Late Riphean Svalbard

* Amard 1992 (*Chuarina* sp, compared to *C. circularis*
pp. 123-131 pl. 1, fig. 1-f pl. 2, fig. 1-f)
Late Proterozoic, West Africa

Zang & Walter 1992b (p. 281, 283 pl. 4, figs A-C, F-I)
Sinian - Early Cambrian, central-eastern China

Veis, Brantvokh & Vorob'eva 1990 Late Precambrian Ghana

Veis, Kozlova & Vorob'eva 1990 Riphean, Southern Urals USSR

Mikhailova & Turchenko 1986 Late Precambrian USSR

Veis & Vorob'eva 1992 Late Precambrian Anabar Massif USSR

* Amard & Affaton (1984)
(p. 975-976 Figure 3)

Wade 1969 = latest Precambrian/Cambrian Central Australia

Ford & Breed 1972a (p. 9) : Late Riphean Arizona USA

Grausman 1997 : Riphean, Western Yakutia USSR = Siberia

Dawer & Vidal 1985 : Late Riphean NW Greenland

Jux 1977 (p. 9-12 pl. 5, figs 1-6) Proterozoic Arizona USA

Zhang et al. 1989 Late Precambrian Hainan Island South China

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Zheng 1980 (p. 59 pl. 1, figs. 1-2^{x10}) Sinian Anhui China
 (pl. 2, figs. 14, 15, 34)

Knoll 1982 (pl. 2, fig. 1, pl. 4, figs. 7, 13)

Du 1982 (p. 2 pl. 2 fig. 1-3) : Precambrian NW Hebe, China

(*) Du 1982 (p. 2-3, pl. 2, fig. 4) : Precambrian NW Hebe, China

Suresh & Sundra Raju 1983 (p. 1-2 pl. 2, figs. 2.1-5) : Precambrian S. India

Mathur 1983 (p. 363, fig. 1A) : late Precambrian Central India

(*) Amard & Affaton 1984 (p. 979 figs. 3a-e) latest Proterozoic (? Vendian)
 Volta Basin West Africa

Pyatiletov 1988 (pl. 6, fig. 5) : Late Riphean-Yudomian Siberia USSR

Cooper, Gago et al. 1982 Vendian/earliest Cambrian Antarctica

Cooper, Gago et al. 1983 : above age reassessed as Vendian/Middle Cambrian

Tang 1995 (pl. 5, figs. 10 x 17) : Precambrian Beijing Region China

Hofmann 1985a (p. 342-343 pl. 35, figs. 2, 4-5 at pl. 36, figs. 6 x 12
 pl. 37, fig. 1, pl. 38, fig. 4, pl. 39, fig. 2)
 Mid-Proterozoic North-West Canada

Zhang, Feng, Ma, Xu & Yan 1991 (p. 119, pl. 1, figs. 1-15 pl. 2, figs. 9 x 12) Late Precambrian
 Hainan Island China

Du & Tian 1985 (pl. 1, figs. 1-5) Precambrian Yanshan Range, N. China
(Qingbaikou System)

Shishkin & Isaev 1999 Late Riphean NE Siberian Platform Russia

Wang, Zhou & Xiao 1984: Late Precambrian, China

(pl. 2, figs 6, 7a, 8b, 9) Anhui

Korkutis 1981: Late Riphean - Early Vendian

western East European Platform USSR

Talyzina 2000 (p. 126-132 pl. 1, figs. 1-6 pl. 2, figs 1-7

pl. 3, figs. 1-6) Neoproterozoic, Sweden

Du & Tian 1986 (pl. 1, figs. 1-5): Precambrian (Qingbaikou System)

Yanshan Mountain northern China

Karlstrom et al. 2000: Neoproterozoic Grand Canyon USA

Knoll 2000: Early Neoproterozoic (Tonian)

(cf.) Hill, Colter & Grey 2000: upper Mid-Neoproterozoic Australia

Butterfield Knoll & Swett 1994: Late Riphean Spitsbergen

(p. 32-34, Figs. 8-11, 13 I)

Haines 1998 (pp 5-7, Figs 5A-5D) Neoproterozoic N. Australia

Vidal & Ford 1985 (p 357-359, Fig 3A)

late Riphean / early Vendian Utah / Arizona USA

Amard 1986 (p. 74, 76-77 pl. 1, fig. 1a,b) Late Riphean Mauritania

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- Zang 1997 (Fig. B) late Neoproterozoic South Australia
- Chen & Zheng 1986 (pl. 1, figs. 1, 4, 123, 143) Late Precambrian
(pre-Ediacaran ~ 647-540 Ma) Huianan China
- Veis et al. 2000: Early-Late Riphean S. Urals / Volga-Urals Russia
- Yin 1991 (p. 259 pl. 3, fig. 12) Late Proterozoic Western Shandong China
- Samuelsson & Butterfield 2001
(Figures 6A-6B) Neoproterozoic, Franklin Mts, NW Canada
- Kumar 2001 (p. 194-195 Figures 6a-f, 6h-j)
Mesoproterozoic (early Vindhyan)
Neemuch district Madhya Pradesh India
- (pyritized chuarids pp. 255-261) in Yuan Xiao Li, Yin & Cao 2001
(C. circularis) p. Figs 2A-2I late Neoproterozoic Anhui Province S. China
- Rai, Shukla & Gautam 1997: Neoproterozoic, Allahabad-Rewa
(p. 784-786, Figs 3c-f, h-j, L-n, p-r, t-v, x-3) area India
- Kumar 1995: Mesoproterozoic (early Vindhyan) Katni area
(cf. C. c. p. 177-178 Figs 4h, 4i) Central India
- Tynn & Donner 1980: Late Precambrian Hailuoto Finland
(p. 12 pl. 3, figs 24-25)

- Zhang et al 1990 (p. 217, pl. 1, figs. 1-10) Late Precambrian, Hainan Island
South China
- Amard 1984 (Figure 3a) Late Riphean Mauritania
- Qian et al. 2001: Neoproterozoic N. Anhui - Jiangsu, E. China
- Şao, Yin & Xing 1999: Neoproterozoic China
- Veis & Vorobeva 2001: Riphean Siberia Russia
- Uukela 2001 (pl. 1, fig. A2) Neoproterozoic Central Finland
- Stern 1997: Palaeoproterozoic - Early Cambrian range
(p. 645-658) abundant in Neoproterozoic
- Niu 2002: Middle/Late Proterozoic, Yan-Liao area N. China
- Niu & Zhu 2002: Neoproterozoic,
Huainan district, Anhui Province China
- Srivastava 2003: Neoproterozoic Rajasthan India
(p. 101 figs 5B-D, 5H-J) (uppermost Vindhyan Supergroup)
- Maithy & Babu 1996 (p. 2, pl. 1, figs 1 & 10-11)
~~(p. 2)~~ pre-Vendian (> 750Ma)
Sulbarga District, Karnataka, India
- Knoll 1985 (Fig 4e) Late Proterozoic, Spitsbergen
- Cao & Liu 2003: Late Proterozoic,
(pl. 2, fig. 11) eastern Yangtze region China

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- Knoll 1984 (p. 151, figs 5H, 6A) : Late Precambrian (Late Riphean)
Nordavstlandet, Svalbard
- Samvelsson 1995 : Late Riphean Kola, Northwest Russia
- Kumar & Srivastava 2003 (p. 146-147, pl. 1, figs. a-g)
Neoproterozoic, Central India
- Veis, Kozlov, Sergeeva & Vorob'eva 2003 : Late Riphean
southern Urals Russia
- Niklas & Chaloner 1976 (p. 100 pl. 1, figs. 1-2) Proterozoic
Arizona USA
- Sun 1994 (Fig. 3A) Early Neoproterozoic
Huainan district Anhui Province China
- Vidal 1994 (Fig. 2D) : Late Riphean, Sweden
- Wang (editor) 1984 (pl. 8, figs. 14 & 19a & 21a, pl. 9, fig. 15b, pl. 10, fig. 15a
(pl. 11, fig. 4, pl. 12, figs. 2 & 10, pl. 13, figs. 1 & 12c & 14)
Late Precambrian (Qinbekou & Late Serran)
Anhui & Jiangsu Provinces China

Yin 2001 (pl. 1, fig. 5): Late Sinian Weng'an, Guizhou (China)
Sun, Wang & Zhou 1986: Late Precambrian (900-700 Ma)
Huainan District Anhui Province (China)

Abduqasimova & Aleksandrova 2003: Precambrian
northern Nuratau range southern Tien Shan, Russia

Jankauskas & Mikhailova 1989: 'Precambrian USSR'

(pl. 12, figs. 1-2)

Arousi, Greenwood & Walter 2000 (Fig. 2b, TEM fig. 3e)
Neoproterozoic Australia

(?) Frey & Cotter 1996: Neoproterozoic Western Australia
(Figure 3e)

Veis et al. 2004 (pl. 4, fig. 8): Late Riphean Mezen Syncline
North European Platform Russia

Zheng, Mu, Zheng, Wang & Xin 1994 (p. 466, 470-471 pl. 1, fig. 6)
Late Precambrian North 'Anhui' (China)

Hong et al. 1988: latest Precambrian
southern Liaoning, (China)

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Snitovskaya et al. 2000 (pl. 1, figs. 3 & 6): Late Riphean Timan Russia
Veis & Vorobeva 1994 (pl. 1, figs. 1, 3-4 & 6, pl. 2, figs. 3-4)
Riphean, Turukhansk Uplift and western slope of
Anabar Uplift, Siberia, Russia
Petrov & Veis 1995 (pl. 1, fig. 22): Late Riphean
Turukhansk Uplift, Siberia, Russia
Brasier, Perejón & San José 1979: Precambrian / Cambrian boundary
Spain
Ivanchenko et al. 2004: Vendian, Volhynia, Ukraine
Jankauskas (editor-in-chief) et al. 1989 (p. 67-68, pl. 12, figs. 1-2)
"Late Riphean" USSR
(aff.) Jankauskas 1982 (p. 103, pl. 41, figs. 2 & 7): Riphean, S. Urals, USSR
Kumar & Srivastava 1997: Neoproterozoic (Upper Vindhyan)
p. 143, pl. 1, figs. 1 & 3-5 & 8 & 11-12) Madhya Pradesh, India
Share & Badve 1981 (p. 34-36, pl. 1, figs. 1-4, text-fig. 2)
Precambrian, Madhya Pradesh, India
Suresh & Gowda 1982: Late Proterozoic, South India

- (?) Cooper et al 1982 : Vendian - Early Cambrian
Northern Victoria Land Antarctica
- Solubkova & Raevskaya 2005 : Early/Middle Riphean, Siberia
- Zhang 1986b (pl. 1, fig 4) : Precambrian (1400 Ma)
near Jixian North China
- Nagy & Porter 2005 (p. 56) : middle Neoproterozoic, NE Utah, USA
- Du & Tian 1989 : Late Precambrian, North China
- Liu 1990 : Mesoproterozoic (1400/1400 Ma), Jixian, Tianjin, China
- Du & Li 1980 (p. 353, pl. 15, fig. 3) : Sinian,
western Yanshan Ranges China
- Yang, Zhang, Zheng & Xu 1980 (pl. 17, figs 1-2) Sinian
northern Jiangsu / Anhui, China
- Dutta et al 2006 (p. 101-110 pl. 1, figs. a-h, pl. 2, figs a-f
(pl. 2, figs a-d = SEM, pl. 2, figs e-f = TEM)
- Vers, Vorob'eva & Solubkova 2006 : Late Riphean - Early Vendian
Vychegda depression, NE margin of E. European Platform, Russia
- Saucher & Serms 2006 (p. 202, 206, Figs. 7e, 8a) Late Ediacaran
Saldania Belt, South Africa

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- Abduazimova & Abdullaev 1998 : Precambrian
Murantau Ore Field, Uzbekistan
- Vorob'eva, Sergeev & Semikhator 2006 (Fig. 2a) Early Vendian
southern Timan region, Russia
- Sun 2005 : Neoproterozoic (800-900 Ma) Yangshan region, N. China
- Sun 2000 : Precambrian (Tixian System), Tixian, Tianjin, China
- Hofmann 1977 (Figures 2a-2j) Late Precambrian, Utah, USA
- (cf.) Damassa & Knoll 1986 : Late Proterozoic
(Figure 5K) South Australia
- Sergeev, Vorob'eva & Petrov 2007 : Early Riphean
(pl. 1, figs. 17 & 21) North Anabar region, northern Siberia, Russia
- Veis & Vorob'eva 1993a (pl. 2, figs. 1, 3, 4 & 8) Late Riphean
Uchur-Maya region, Siberia, Russia
- Chakrabarti, et al. 2006 : Late Proterozoic
Bhima Basin, Andhra Pradesh, India
- Veis 1983 : Late Riphean, Uchur-Maiskii region, USSR
- (cf.) Ishchenko 1983 (pl. 12, fig. 5) : Vendian, Ukraine, USSR

- Hong Huang Liu et al. 1991 : Late Precambrian
lp. 163, pl. 8, figs. 1-5 & 7, pl. 9, figs. 7-10, pl. 11, figs. 1-3 & 9)
southern Liaodong Peninsula Liaoning Province (China)
- Abduazimova & Korsakov 1992 : Late Riphean - Vendian
West Uzbekistan
- Korsakov & Abduazimova ^{and Asatullaev} 1992 : Middle / Late Riphean
West Uzbekistan
- Dutta 2006 (pl. 1, fig. d, pl. 6, figs. a-h, pl. 7, figs. a-f, p. 105-106, 108-116)
Early Mesoproterozoic Central India
- faucher & ferms 2005 extended abstract : Late Ediacaran
Saldani Belt, South Africa
- Moczydtowska 2008 a range Mesoproterozoic - Late Neoproterozoic
- (?) Frey 2005b : mid-Neoproterozoic (Cryogenian)
Officer Basin Western Australia
- Kuznetsova 2007 : Late Riphean (Vendian) Arctic Urals Russia
- Kuznetsov et al 2009 : Late Riphean, western Polar Urals Russia
- Vorobieva, Sergeev & Knoll 2009 : Late Riphean - Vendian (early Cryogenian -
6.185, Fig 14.6) NE margin of E. European Platform (in Ediacaran)
Russia

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Sharma et al. 2009 (Figs 6a-o + 7a-g) Mesoproterozoic
Peninsular India

Vorob'eva, Sergeev and Kholl 2009
'latest Riphean? - Vendian (early Ediacaran)
Timan trough region northern Russia

Qian, Wang & Yan 2008: Neoproterozoic (including Late Riphean)
(p. 25, 27-28, English p. 122-124, pl. 1, fig. 1-7, pl. 2, fig. 5-6, pl. 3, fig. 6-7, pl. 4, fig. 4)
SE margin of North China

Semikhatov, Shurkin, Akseverov et al. 1991: Late Riphean
Baikterian Anticlinorium South Urals Russia

Ivanov 1992: Vendian, Anadyr-Koryak Region far NE Siberia Russia

Bhat, Ram & Koul 2009 (figure 5s): Neoproterozoic,
Bidda, Jammu region, northern India

Qian, Jiang & Yu 2009 (p. 2-3, text-fig. 10.1-7)
Neoproterozoic, N. Anhui & Jiangsu N. China

Tafari, Shemirani & Hamdi 2007 Late Proterozoic
Takab area NW Iran

Charnov, Kostyleva & Veis 2010 : Late Riphean
North Molokova borehole
East European Platform, Central Russia

Singh, Babu & Shukla 2009 (p. 10-12, pl. 3, fig. i, pl. 4, fig. a-e, g-i)
Neoproterozoic, Satna district, Madhya Pradesh India

Sharma, Bajpai, Shukla & Shukla 2010 Early Neoproterozoic
(p. 54, pl. 1, figs. 1-7 (SEM), pl. 2, figs. 1-6 (SEM), pl. 3, figs. 1-6 (TEM))
Rampura, Madhya Pradesh India