

Supplementary Table 1: Original and emended descriptions of myxobacterial species as cited in Skerman *et al.* (1980) (excerpts of the references given in column 1). The German texts for *C. lanuginosus*, *M. boletus* and *P. fumosum* are followed by the English translation (this study).

Species name and authors of the species description		Figures this paper
<i>Chondromyces apiculatus</i> Thaxter 1897	<i>Chondromyces apiculatus</i> , nov. sp. Plate XXX, Figs. 1-15---Cystophore stiff, rigid, simple, rarely sparingly branched, bearing the single spherical cyst-mass terminally. Cysts very variable in form, shape and size, cylindrical to broadly turnip-shaped, the young cysts fusiform or nearly so, the rods retreating from each end towards the center and leaving behind a shriveled membrane forming a basal and terminal appendage, the latter longer and pointed. Color bright orange. Rods 1 by 3 – 20 μ . Cysts, turnip-shaped form, average about 35 μ broad by 28 μ long; cylindrical form, average 35 by 18 μ . Cystophores about 500-1000 μ in height. All dimensions subject to great variations. On dung of antelope from Liberia, Africa.” Followed by more detailed description, especially differentiation “... from its nearest ally, <i>C. crocatus</i> ...”. Figure on Table XXX, page 405-406.	Figure 1
<i>Chondromyces crocatus</i> Berkeley and Curtis 1874	“600. <i>Chondromyces crocatus</i> . B. & C. – On decayed melons. Car. Inf. No. 1335. Stem closely compacted, orange, subcartilaginous, branched, the branches more or less divaricate, nodular at the apex; spores elongate-ovate. With a very short pedicel.” Figure in Berkeley (1857), page 313.	Figure 2
<i>Chondromyces lanuginosus</i> Kofler 1913	“ <i>Chondromyces lanuginosus</i> nov.spec. (Fig. 1-3) Frk. Zystophor: Aufrecht, gegen die Spitze verschmälert; einfach; meist ein-bis mehrmals dichotom verzweigt; Streifung in der Längsrichtung, besonders bei älteren Stadien und beim Austrocknen. Größe: 700 bis 1000 μ hoch, Durchmesser an der Basis 40 bis 130 μ , oben oft nur 20 μ Farbe: im frischen Zustand farblos, später oft gelblich. Zusammensetzung: Homogene, hyaline Masse, von einer dichteren, wohl aus derselben Substanz bestehenden Membran umgeben. Stäbchen auch bei Zusatz von Eau de Javelle nicht zu erkennen. Zystenköpfchen: Gestalt: Kugelförmig oder etwas oval, besteht aus einer sehr großen Zahl von Zysten, die jedoch nur an ihrem Ende voneinander getrennt sind. Jede Zyste läuft in einem Fortsatz oder ein Haar aus von 15 bis 50 μ Länge, das bei schwacher Vergrößerung einer behaarten Kugel	Figure 3

gleich.

Durchmesser: 80 bis 200 μ

Farbe: Fleischfarbig, zart rosa bis orange; sie steht mit dem Feuchtigkeitsgehalt und der Temperatur im Zusammenhang. Blieb die Pe.Sch. gut angefeuchtet einen Tag im Thermostaten, so zeigten die neu gebildeten Frk eine sehr lichte Farbe; ließ man den Mist dann etwa eine halbe Stunde unbedeckt bei Zimmertemperatur stehen, so dunkelten die Zystenköpfchen rasch nach.

Membran: Fehlt um Zysten und Haare. Obwohl die Haare an ihrem Ende so erstaunlich dünn sind und nur aus wenigen nebeneinanderliegenden Stäbchen bestehen, vermögen sie sich doch ohne Umhüllung frei in der Luft zu erhalten, sie werden von einem konsistenten Schleim zusammengekittet, der sich wie schon p. 852 bemerkt, mit Tusche leicht nachweisen lässt.

Zahl: Eines bis viele auf jedem Zystophor oder Ast, meist 2 bis 7.

Stäbchen 3 bis 6 μ .

Auftreten: Wegen ihrer Höhe, Zierlichkeit und großen Zahl gleichen die Frk. eher einem Schimmelpilz als einer Myxobakterie. Die Ausbreitung erfolgt ruckweise; mehrere Tage hindurch ist oft kaum ein Fortschritt zu bemerken; plötzlich verbreiten sie sich dann innerhalb eines einzigen Tages über ein weites Gebiet, vermutlich dann, wenn die Feuchtigkeit eine besonders günstige ist. Ha. M. aus den Donauauen jenseits der Rbr.“

“*Chondromyces lanuginosus* nov.spec. (Fig. 1-3) **Fruiting body:** Cystophor: erect, narrowing towards the tips; single; mostly branched dichotomously once or several times; striped in longitudinal direction, especially when old and during desiccation. Size: 700 to 1000 μ high, diameter at the base 40-130 μ , at the tip often only 20 μ . Color: in a young state colorless, later often yellowish.

Composition: homogenous hyaline mass, surrounded by a denser membrane consisting most probably of the same substance. Rods are not distinguishable, even after addition of Eau de Javelle. Heads of the cysts: Shape: globular or slightly oval, consisting of a high number of cysts which are separated from each other only at their tips. Each cyst ends in an appendage or hair, 15 to 50 μ long, at low magnification, the heads looks like hairy spheres. Diameter 80 to 200 μ . Color: flesh-colored, faintly rose to orange, in connection with humidity and temperature. When the Petri dish stood well moistened in the thermostat for one day, the newly formed fruiting bodies showed a very light color, when the dung was then exposed without cover to room temperature the cyst heads darkened rapidly.

Membrane: lacking around cysts and hairs. Though the hairs are astonishingly thin and consist of only a few neighboring rods they are staying freely in the air without envelop, they stick together by means

	<p>of a consistent mucilage which – as already mentioned on p. 852 – may be verified easily with indian ink. Number: one up to many on every cytophor or branch, mostly 2-7. Rods: 3 to 6μ. Occurrence: Because of their height, fragility and high number, the fruiting bodies resemble molds rather than myxobacteria. The proliferation occurs jerkily; almost no development can be detected during several days; once in a sudden, they spread over a wide area within one day, most assumedly when the humidity is particularly favorable. [Ha. M.?] from the floodplains of the Danube river, beyond the [Rbr. Reichsbrücke in Vienna?].” Figure 1-3, page 877.</p>	
<p><i>Chondromyces pediculatus</i> Thaxter 1904</p>	<p>“<i>Chondromyces pediculatus</i>, nov. sp. Plate XXVI, figs. 7-13. Orange-yellow becoming orange-red on drying. Cystophore solitary, erect, simple, usually rather slender and somewhat wrinkled; the cyst forming a loose, umbel-like head. Cysts pale yellowish, often nodding, nearly spherical to long-cylindrical clavate or pyriform, usually broader and more or less abruptly flattened distally, where the papery cyst wall may be creased or folded so as to produce a more or less conspicuously roughened appearance; the base somewhat narrower, more or less wrinkled, passing with various degrees of abruptness to the pedicel, which is usually relatively long, slender, and shriveled. Cystophore about 300-700 μ in height, the head 150-500 μ in diameter. Cysts about 45-60 x 30-40 μ, their pedicels often 40-60 μ long. Rods of rising pseudoplasmodium 2-4 x 0,6-0,7 μ. On goose dung from Sandy Run, S.C.” Figures on plate XXVI, no. 7-13; page 411.</p>	<p>Figure 4</p>
<p><i>Melittangium boletus</i> Jahn 1924; type species of the genus</p>	<p>„16. <i>Melittangium boletus</i> n. sp. Cyste gestielt, hutpilzförmig, jung weiß, dann gelblich fleischfarben, zuletzt gelblichbraun bis nussbraun, eingetrocknet mehr rötlichbraun. Größter Durchmesser der Cyste etwa 100 μ, Höhe 40-50 μ, Länge des weißen Stieles um 40 μ. Länge der Stäbchen in den Cysten 3-4 μ x 0,5 μ. Unter den normalen Cysten finden sich häufig kugelförmige, die kleiner sind (50-60 μ Durchmesser), auch Verwachsungen benachbarter Cysten sind nicht selten, ebenso fehlt bei einzelnen Cysten oft der Stiel. Derartige Formen hat wohl Quehl beobachtet und sie für den <i>Chondromyces lichenicolus</i> Thaxter gehalten. Nicht gerade selten auf Kaninchenmist und Rehmist aus der Nähe Berlins. Auf Damwildmist aus Dänemark. Abbildungen Taf. II, Fig. 17 und 18.“ “16. <i>Melittangium boletus</i> n.sp. Cysts stipitate, mushroom like, young colonies white, later yellowish, flesh coloured, in the end yellowish brown or nut brown, dried cultures also reddish brown. Highest diameter of the cyst ca. 100</p>	<p>Figure 5</p>

	<p>μ, height 40-50 μ, length of the white stem ca 40 μ. Rods in the cysts 3-4 μ x 0.5 μ. Below these normal cysts there are often globular smaller ones (50-60 μ diameter), also adhesions of neighbouring cysts are not uncommon, in addition, several cysts may lack the stem. Such forms might have been observed by Quehl who considered them <i>Chondromyces lichenicolus</i> Thaxter. Not seldom on rabbit dung and roe deer dung near Berlin. Figures on plate II, No. 17 and 18.”</p>	
<p><i>Polyangium solediatum</i> (ex Thaxter 1904) Brockman 1989, nom. rev.</p>	<p>“4. Polyangium solediatum (ex Thatcher 1904) nom. rev.....Vegetative rods are 0.8-1.2 x 3.0-6.0 μm. Sori are yellow-orange, up to 0,5 mm in diameter, and flat or cushionshaped, consisting of up to hundreds of sporangia. The latter are often contained in slime-delimited groups of several sporangia each. Sporangia are polygonal when appressed within the sorus but are nearly spherical when free and are 5-15 μm in diameter. Myxospores are shorter than vegetative cells but similar, 0,8 x 3-4 μm. Vegetative growth has not been described. Pure culture (David, 1981) has been obtained on <i>Escheria coli</i>-smearred Ca²⁺-water agar. This organism is noncellulolytic. Obtained from animal dung, decomposing plant material, tree bark, and soils rich in organic matter. <i>Illustrations</i>: Thaxter 1904, plate XXVII, fig. 22-30;...ctd.”</p> <p>No figures by Brockman.</p>	Figure 6
<p><i>Polyangium spumosum</i> (ex Krzemieniewska and Krzemieniewski 1927) Brockman 1989, nom. rev.</p>	<p>“8. Polyangium spumosum (ex Krzemieniewska and Krzemieniewski 1930) nom. rev.</p> <p>Vegetative cells are thick rods with blunt, rounded ends, 1.1.-1.5 x 2.7 -5.5 μm (Krzemieniewska and Krzemieniewski, 1937a). Sori consist of numerous ellipsoidal sporangia 7-24 x 9-34 μm, loosely arranged into spherical, oval irregular to elongated accumulations not surrounded by a common membrane but covered by a weak layer of colorless slime. Sporangial walls are colorless to slightly brownish and transparent.</p> <p>Myxospores from mature sporangia are cylindrical with blunt ends and 0.4-0.5 x 2-3 μm.</p> <p>This organism can be cultivated in manure cultures and on filter paper which is digested, but it has not been obtained in pure culture. Vegetative growth is flesh-red (Krzemieniewska and Krzemieniewski , 1938a).</p> <p>Obtained from Polish soils and decaying plant debris, peat and leaf mold; most often observed on damp blotting paper inoculated with these materials. <i>Illustrations</i>: (Krzemieniewska and Krzemieniewski, 1926, Plate V, Fig 19; and 1930 Plate XVI, Figs 10-12.“</p> <p>No figures by Brockman.</p>	Figure 7
<p><i>Cystobacter ferrugineus</i> (Krzemieniewska and</p>	<p>“3. <u><i>Cystobacter ferrugineus</i></u>.....Vegetative cells tapered with round ends 0.6 to 0.8 by 4-15 μm (Fig. 1). Resting accumulations (see Fig. 27, McCurdy 1969) consist of irregular, branched and</p>	Figure 8

<p>Krzemieniewski 1927) McCurdy 1970, comb. nov.</p>	<p>occasionally constricted coils. At first grayish or flesh coloured becoming bright orange yellow, orange red or reddish brown. The enclosing membrane may be absent or difficult to observe when present bearing the imprints of the enclosed microcysts (Fig.3). The external slime is colorless to yellow orange.</p> <p>Microcysts phase-dense or refractile, rigid, oval to short rod-shaped with rounded ends, 1.1.to 1.8 by 1.8.to 5 µm (Fig. 2).</p> <p>Vegetative colonies grayish white to slightly salmon-coloured with many fine radiating ridges and concentric ripples, later clearing in the centre. The edge is at first slightly heaped but becoming thin with tongue-like extensions. Cultivated easily on Sp, ECM and dung pellet agar. Oxidase and urease negative. Aesculin not hydrolysed. Aerobic. Maximum temperature 37° C, optimum 27 -30° C. Antibiotic sensitivity (disks) inhibited by tetracycline (10 µg), chloramphenicol (10 µg), erythromycin (5 µg). Resistant to neomycin (10 µg), streptomycin (5 µg), penicillin (10 units). Response to kanamycin (10 µg) variable. Source and habitat: originally obtained from Polish soil on rabbit dung. Common to bacterial streaks over water agar inoculated with soil. Reference strain: Windsor M-203.” Figures 1-3.</p>	
<p><i>Cystobacter minus</i> (Krzemieniewska and Krzemieniewski 1926) McCurdy 1970, comb. nov.</p>	<p>“2. <u>Cystobacter minus</u>Vegetative cells 0.6 to 0.8 by 3-11 µm, slightly tapered with squarish ends as in <u>Archangium gephyra</u> (Fig. 9). Sporangia (Fig. 11, see also Fig. 30, McCurdy 1969) spherical or oval 20 to 70 by 20 to 50 µm, at first pale pink becoming brownish, walls definite, 0.5 to 1.0 µm thick, transparent revealing contents. Sporangia covered by a thin, transparent slime and occurring in flat accumulations of up to 0.5 sq.µm. A secondary sporangium may be formed within the first as a result of contraction of the contents and the formation of a new wall (see also Fig. 30, McCurdy 1969). Microcysts (Fig. 10) phase-dense or refractile, oval to short rodshaped 0.8 to 1.2 by 1.3 to 2.7 µm. Vegetative colonies on Sp agar are at first grayish translucent or slightly pink with a definite edge. Later the edge becomes thin and ill-defined. The surface is marked by many loosely spiralling lines. Cultivated on Sp, ECM and Yeast Ca⁺⁺ agars. Nitrate not reduced. Catalase is produced. Oxidase negative, hydrolyzes starch, aesculin, RNA and DNA. Urease negative. Does not digest cellulose. Aerobic. Temperature range 18 -37° C, optimum 28-30° C. Antibiotic sensitivity (disks); inhibited by tetracycline (10 µg) and chloramphenicol (10 µg). Resistant to neomycin (10 µg), kanamycin (10 µg), streptomycin (5 µg), erythromycin (5 µg). Source and habitat: First isolated from sterilized rabbit dung placed in contact with soil (Poland). May be obtained from soil placed on <u>Sarcina lutea</u> streaks on water agar. Relatively slow in appearance but not uncommon. Reference strain: Windsor M-307.” Fig. 9 – 11.</p>	<p>Figure 9</p>

<p><i>Polyangium fumosum</i> Krzemieniewska and Krzemieniewski 1930</p>	<p>“3. <i>Polyangium fumosum</i> n.sp. Eine überaus interessante Art, die flache krustenartige, aus 2-20 (manchmal auch mehr) in eine Schicht angeordneten Zysten bestehende Sori bildet. Diese sind entweder rundlich (Durchmesser bis 90 μ) oder aber unregelmäßig geformt, dabei oft länglich von Gestalt (Länge bis 400 μ). Ihre rauchgraue Farbe stammt von den sie umgebenden Schleimhüllen. Äußere Umrisse der Hüllen scharf konturiert. Hüllen an der Peripherie der Zysten 2.4-3.5 μ dick. Die manchmal fast kugelrunden (Durchmesser 13-48 μ), für gewöhnlich aber etwas länglich geformten (ca. 44 x 36 μ) Zysten sind farblos und von eigenen, durchsichtigen Membranen umschlossen. Stäbchen in den Zysten gleichen den vegetativen Zellen: sie sind wie diese lang cylindrisch gerade, an den Enden abgerundet und den Zellen von <i>Polyangium vitellinum</i> ähnlich (Taf. XVI, Fig 6, 7, 8, 9). Die Zellen in den Zysten sind 2.7.-5.7 μ lang und 0.7-0.9 μ breit. Diese Art unterscheidet sich von den anderen durch ihre Farbe, sowie durch die Hüllen. Die gemeinsame Schleimhülle der Sori wird mit der Zeit zu einem faltigen Sacke.“</p> <p>“3. <i>Polyangium fumosum</i> n.sp. A very interesting species which forms flat crustaceous sori consisting of 2-20 (sometimes more) cysts arranged in one layer. The cysts are either roundish (diameter up to 90 μ) or are irregularly, often elongated (length up to 400 μ) formed. Their smoky grey color is due to the surrounding mucilage layers. The outer shape of the envelops [is] sharply contoured. Envelop at the periphery of the cysts is 2.4-3.5 μ thick. The sometimes almost globate (diameter 13-48 μ), but mostly a bit elongate (ca. 44 x 36 μ) cysts are colorless and each is surrounded by a transparent membrane. The rods in the cysts are 2.7.-5.7 μ long and 0.7-0.9 μ wide. This species differs from the others by its color and by its envelops. The mucilage layer common to the sori gradually turn to a wrinkled bursa.”</p> <p>Figures Plate XVI, no. 6 – 9.</p>	<p>Figure 10</p>
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Supplementary Table S2: Fatty acid composition of the type strains.

Data from Garcia *et al.* (2011, see below), or this study (^a). Strain Cm c5^T was grown on VY/2 agar with 1 g l⁻¹ casitone and 0.3 g l⁻¹ yeast extract added. Strain Me b8^T was grown on CY agar.

Only compounds with percentages 0.2 or higher are listed. All cultures derived from DSMZ. Numbers for C_{14:0}, C_{15:0} and C_{16:0} are the amounts of fatty acid methyl ester followed by the amounts of the respective O-alkylglycerols, and for iso-C_{15:0} followed by the amounts of the respective O-alkylglycerols and dimethylacetals. BCFAs: branched chain fatty acids. Feature 1 includes iso-C_{15:1} and C_{13:0}-3OH, Feature 4 includes anteiso-C_{17:1} Bi/I. ^b: 9,10 methylated cyclic C_{16:0}.

Fatty acid	Cb fe18	Cb m2	Me b8 ^{Ta}	Cm a14 ^T	Cm c5 ^{Ta}	Sy t2 ^T	Cm p51 ^T	Pl s12 ^T	Pl sm5 ^T	Pl fu5
C _{13:1} AT 12-13					0.9					
C _{14:1} ω5c	0.7			0.3			0.4	1.0	1.0	
C _{14:0}	7.0	5.7	1.1	0.8		0.6+0.5	0.8	0.6	0.6	
C _{15:0}	0.2	0.3		0.3+1.3	0.6	0.9+1.6	0.6+0.6	0.1+0.4		
C _{16:1} O-alkylglycerol				11.9		5.3		1.4		
C _{16:1} ω5c	25.4	26.9	4.4		0.8	2.1	1.4	0.5	0.7	1.3
C _{16:1} ω7c			0.2	26.5	37.4	14.1	29.4	33.7	37.3	55.3
C _{16:1} ω11c						0.3	0.3			
C _{16:0}	9.7	10.2	0.6	9.5+9.1	2.5	4.5+1.1	11.7+5.6 +5.3 ^b	6.0+7.4	4.2	5.7+1.4
C _{17:1} ω 7c								0.5	0.5	
C _{17:0}				2.0		4.0	2.2	1.2	0.3	
C _{18:0}	0.5	0.3		2.9		2.1	4.8	2.7	3.2	1.8
C _{18:1} ω9c				3.0	16.5	7.5	1.9	1.3	25.5	5.4
C _{18:2} ω6,9c				2.1	2.2	0.9	1.9	1.3	1.5	
C _{18:3} ω6,9,12c			0.7							
Hydroxylated										
C _{14:0} 3-OH		0.4								
C _{16:0} 2-OH	1.1	0.8		1.5				0.2		
C _{16:1} 2-OH										
C _{17:0} 2-OH					1.8					

C _{16:0} 3-OH		0.1	0.3							
C _{17:1} 2-OH				8.9		11.3	11.0	2.9	6.0	0.6
BCFAs										
iso-C _{11:0}			0.2							
iso-C _{13:0}	0.3		1.5			0.3				
iso-C _{14:0}						0.8				
iso-C _{15:0}	14.8 +9.6 +4.2	17.0+ 5.7 +8.9	37.8	7.7 +2.5 +0.6	19.0	17.3 +4.3 +0.4	11.3 +1.7 +0.6	23.4 +0.6 +5.9	10.0 +0.8 +5.7	14.4 +0 +3.3
anteiso-C _{15:0}			0.4							
iso-C _{16:0}	2.0	1.9	0.6	0.8	2.2	9.0	1.8	0.8		1.4
iso-C _{17:0}	4.3	6.5	18.9	4.9	11.9	8.5	5.7	8.1	2.8	9.5
iso-C _{18:0}						1.6	1.0			
iso-C _{17:1} ω5c	0.2	0.2								
anteiso-C _{17:0}			1.3			0.5		0.2		
iso-C _{14:0} 3-OH		0.4	19.1		0.9					
iso-C _{15:0} 3-OH	0.5	1.2								
iso-C _{17:0} 2-OH	18.8	13.8								
iso-C _{17:0} 3-OH			1.7							
Feature 1					2.0					
Feature 4			3.9		1.3					
unknown 13.565			5.3							
unknown 14.959			0.4							

Garcia, R., Pistorius, D., Stadler, M. & Müller, R. (2011). Fatty acid-related phylogeny of myxobacteria as an approach to discover polyunsaturated omega-3/6 fatty acids. *J Bacteriol* **193**, 1930–1942.