STATUS OF THE GENERIC NAME
MYCOBACTERIUM LEHMANN AND NEUMANN¹

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Mycobacterium Lehmann and Neumann (1896, 363) has been commonly accepted as the name of a genus of acid-fast bacteria from the time of its proposal; its legitimacy, however, has not gone unchallenged. Vuillemin (1913, 527) rejected Mycobacterium Lehmann and Neumann 1896 as a later synonym of Sclerothrix Metschnikoff 1888, placing the latter in a list of generic names which he proposed for conservation; Enderlein (1917, 315; 1925, 259) likewise rejected Mycobacterium as a later synonym of Sclerothrix. Buchanan (1918, 56; 1925, 387) noted the priority of Coccithrix Lutz 1886 over Mycobacterium. The nomenclatural status of the generic name Mycobacterium Lehmann and Neumann requires review.

DISCUSSION

Koch (1882), in his classical paper on the etiology of tuberculosis, used several vernacular names to designate the causal organism (viz. Tuberkel-Virus, Tuberkelbakterien and Tuberkelbacillen); however in this paper he proposed neither a generic name nor a species name in the form of a (Linnaean) binary combination.

Zopf (1883, 67) proposed the first species name, Bacterium tuberculosis, for Koch's tubercle bacillus.

Klein (1884b, 34) transferred the organism to the genus Bacillus Cohn, proposing the name Bacillus tuberculosis (Koch) (sic) Klein.

Koch (1884) published a second paper on the etiology of tuberculosis in which he again used only vernacular names when referring to the causative organism of tuberculosis.

Lutz (1886, 98 and 99) placed both the leprosy bacillus and the tubercle bacillus in a new genus for which he pro-

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posed the name Coccothrix. The pertinent statements by Lutz are:

. . . Für den Lepraspaltpilz und verwandte Organismen schlage ich vor eine Abteilung der Cocco-trichaceen mit dem Genus Coccothrix zu bilden. Letzteres ist folgendermassen zu definieren:

Kleine, runde, kokkenähnliche Zellen, die sich ohne Mitbeteiligung der Zellmembran nur in einer Richtung teilen und daher einzeln oder in Reihen getroffen werden. Dieselben sind vonden gedehnten, allmählich gallertig verquellenden, Zellhäuten überzogen; zwischen den einzelnen Zellen befinden sich Interstitien, welche deren Durchmesser and Grösse übertreffen. Durch Färbung der innersten Schichten der membranösgallertigen Hülle entstehen Bilder, welche wie auf Fädenangereihte Perlen oder wie Stäbchen aussehen. Es finden sich ausserdem grössere zum Teil ovale und doppelt konturierte Zellen, teils frei, teils am Ende der Zellreihen.

In dieses Genus ist vorderhand mit Sicherheit der Lepra- und Tuberkelpilz einzureihen.

Erwin F. Smith (1905, 172 and 174) rejected the generic name Cocothrix (sic) Lutz because of its similarity to Cocotrachium (sic) Link. Vuillemin (1913, 527) designated Koch's tubercle bacillus as the type species of the genus Coccothrix Lutz but rejected this generic name because of the likelihood of confusion with Coccotrichum Wallroth (see Bact. Code, 1958, Rule 27). According to Vuillemin:

Lutz avait créé 1886 un genre Coccothrix ayant pour type le Bacille tuberculeux de Koch. Il est à craindre que ce nom, resté peu connu d'ailleurs, provoque une confusion avec Coccotrichum Wallroth. Noun préférons Sclerothrix Metchnikoff 1888. Les noms postérieurs, tels que Mycobacterium sont des synonymes superflus.

However, even though Coccothrix has the same etymology

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as Coccothrichium and Coccotrichum, orthographically it differs substantially from both of these and therefore does not cause confusion. Coccothrix is neither an orthographic variant nor a homonym of either Coccothrichium or Coccotrichum (Rule 27).

Lutz did not use his new generic name in a binary combination for either of the two species he included in his genus, nor did he cite a previously and effectively published description of either of these species under another name. Therefore, according to Opinion 20(4) (Internatl. Bull. Bact. Nomen. and Taxon. 8:162 (1958)), the generic name Coccothrix Lutz was not validly published even though later authors (e.g. Unna 1887, 11; Enlows 1920, 31; Buchanan 1925, 275) have cited Coccothrix Lutz and in some cases have ascribed (incorrectly) the combinations Coccothrix leprae and C. tuberculosis to Lutz (also see DeToni and Trevisan 1889, 944 and 943; Vuillemin 1913, 527; Bergey et al. 1934, 536; Hauduroy et al. 1937, 291 and 1953, 327 and 335; Reed 1939, 810 and 1948, 877; Krassilnikov 1941, 109 and 107 and 1949, 180 and 179; Hanks 1948, 882).

Metschnikoff (1888, 70) proposed the name Sclerothrix for a genus to include S. kochii, the tubercle bacillus of Koch, which becomes the type species of the genus by monotypy. However the generic name Sclerothrix Metschnikoff is illegitimate as a later homonym of the algal generic name Sclerothrix Kützting 1849, 319 (Rule 24d). It should be noted here that the earliest legitimate specific epithet for the type species of this genus is tuberculosis (from the basionym Bacterium tuberculosis Zopf 1883, 67), and the specific epithet kochii is therefore illegitimate (Rule 24b). The species name Sclerothrix kochii was corrected to S. tuberculosis by Vuillemin (1913, 527).

Lehmann and Neumann (1896, 363) proposed the name Mycobacterium for a genus comprised of three species: "Mycobacterium tuberculosis (R. Koch) Lehm. et Neum.," "Mycobacterium tuberculosis avium (Maffucci). Lehm. et Neum." and "Mycobacterium leprae. Armauer Hansen. (Lehm et Neum.)." Winslow et al. (1917, 554) were the first to designate a type species for this genus - Mycobacterium tuberculosis (Koch) (sic) Lehmann and Neumann. Lehmann and Neumann (1896, 363) incorrectly cited "Bacillus tuberculosis Koch" 1884 as the basionym of Mycobacterium tuberculosis. As mentioned previously, the

first binary combination proposed for this organism was Bacterium tuberculosis Zopf 1883. The type species of the genus Mycobacterium is correctly cited as Mycobacterium tuberculosis (Zopf) Lehmann and Neumann.

Lehmann and Neumann (1899, 114) later recognized the fact that Metschnikoff (1888, 70) had earlier proposed the generic name Sclerothrix for a monotypic genus to include S. kochii, the tubercle bacillus of Koch. However they defend the name Mycobacterium and reject the priority of Sclerothrix Metschnikoff in the following statement:

. . . Wir hatten diesen Namen [Sclerothrix und S. kochii] sofort acceptiert, wenn wir ihn gekannt hätten, glauben aber nach den Regeln der botan. Nomenclatur jetzt bei unserem Namen bleiben zu sollen, da Metschnikoff nur einen bedingungsweisen Vorschlag machte, sein neues Genus nicht streng definierte, selbst nie von dem neuen Namen Gebrauch machte und wir einmal selbst einen Namen gegeben haben.

Although the priority of the generic name Sclerothrix Metschnikoff cannot be dismissed on the basis of the arguments just quoted, Sclerothrix Metschnikoff 1888 is illegitimate as a later homonym of the algal generic name Sclerothrix Kützing 1849. Consequently, Mycobacterium Lehmann and Neumann is the first validly published and legitimate name for the genus which has as its type species the tubercle bacillus of Koch (Bacterium tuberculosis Zopf 1883, 67).

Thirteen years after Lehmann and Neumann had proposed the name Mycobacterium, Orla-Jensen (1909, 329) proposed Mycomonas as a substitute name for Mycobacterium as follows:

An die Familie Actinomycetes schliessen sich nach Lehmann und Neumann die Gattungen Corynebacterium und Mycobacterium, welche ich lieber Corynemonas und Mycomonas nenne.

Being a substitute name, Mycomonas Orla-Jensen is illegitimate (rule 23) and becomes a later synonym of Mycobacterium Lehmann and Neumann. Although Orla-Jensen did

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not name or indicate any species as belonging to his genus, according to Rule 9c (3) (d) the publication of a new generic name as an avowed substitute for an earlier one does not change the type of the genus. Therefore the type species of the genus Mycomonas Orla-Jensen is the same as that of Mycobacterium Lehmann and Neumann, i. e. Mycobacterium tuberculosis (Zopf) Lehmann and Neumann.

Battaglia (1938, 166) use "Eumyces tuberculosis" as the title of a publication wherein he contended that the characteristics of the tubercle bacillus are such that it should be included among the "Eumycètes" (the true fungi). "Eumyces," which does not appear in the body of Battaglia's paper, was not proposed as a generic name, hence it has no standing in nomenclature. Battaglia apparently used "Eumyces" as the obvious singular form of the plural "Eumycètes," and "Eumyces tuberculosis" probably was intended to mean "the tuberculosis eumycete." Reed (1948, 876 and 877) incorrectly cited "Eumyces Battaglia" as a synonym of Mycobacterium Lehmann and Neumann and "Eumyces tuberculosis Battaglia" as a synonym of "Mycobacterium tuberculosis (Schroeter) Lehmann and Neumann." Hauduroy et al. (1953, 335) incorrectly cited "Eumyces tuberculosis Battaglia" as a synonym of "Mycobacterium tuberculosis var. hominis (Schroeter) Lehmann and Neumann."

CONCLUSIONS

1. Coccothrix Lutz (1886, 98) was the first name proposed for a genus having Koch's tubercle bacillus designated as its type species. Coccothrix Lutz was not validly published and has no standing in nomenclature.

2. Sclerothrix Metschnikoff (1888, 70) was a validly published generic name but, as a later homonym of Sclerothrix Kützing (1849, 319), is an illegitimate earlier synonym of Mycobacterium Lehmann and Neumann (1896, 363).

3. Mycobacterium Lehmann and Neumann (1896, 363) is the first validly published and legitimate name of a genus having Koch's tubercle bacillus (Bacterium tuberculosis Zopf 1883, 67) as its type species.

4. Mycomonas Orla-Jensen (1909, 329) was a validly published generic name but is illegitimate as a later synonym of Mycobacterium Lehmann and Neumann (1896, 363).

The type species of this genus is the same as that of Mycobacterium, i.e. Mycobacterium tuberculosis (Zopf) Lehmann and Neumann.

5. "Eumyces" Battaglia (1938, 166) was not proposed as a generic name and does not have standing in nomenclature; Reed (1948, 876) incorrectly cited "Eumyces Battaglia" as a generic name synonymous with Mycobacterium Lehmann and Neumann.

6. The synonymy of the generic name Mycobacterium may be indicated as follows:

Mycobacterium Lehmann and Neumann 1896, 363.

(Coccothrix Lutz 1886, 98; Sclerothrix Metschnikoff 1888, 70 (not Sclerothrix Kützing 1843, 229; not Sclerothrix Kützing 1849, 319); Mycomonas Orla-Jensen 1909, 329.)

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