Enterobacter aerogenes Hormaeche and Edwards 1960 (Approved Lists 1980) and Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) share the same nomenclatural type (ATCC 13048) on the Approved Lists and are homotypic synonyms, with consequences for the name Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980)

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Abstract

Enterobacter aerogenes Hormaeche and Edwards 1960 (Approved Lists 1980) and Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) were placed on the Approved Lists of Bacterial Names and were based on the same nomenclatural type, ATCC 13048. Consequently they are to be treated as homotypic synonyms. However, the names of homotypic synonyms at the rank of species normally are based on the same epithet. Examination of the Rules of the International Code of Nomenclature of Bacteria in force at the time indicates that the epithet mobilis in Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) was illegitimate at the time the Approved Lists were published and according to the Rules of the current International Code of Nomenclature of Prokaryotes continues to be illegitimate.

The name Enterobacter aerogenes Hormaeche and Edwards 1960 (Approved Lists 1980) was created by Hormaeche and Edwards [1] for a taxon at the rank of species that had previously been known as ‘Aerobacter aerogenes’ [2]. In recognizing the fact that the non-motile strains of ‘Aerobacter aerogenes’ were members of the species Klebsiella pneumoniae (Schroeter 1886) Trevisan 1887, Hormaeche and Edwards [2] proposed that the genus ‘Aerobacter’ (Beijerinck 1900) be restricted to taxa that could be distinguished from the genus Klebsiella and retained the use of the name ‘Aerobacter aerogenes’ in a sense different to previous usage [2]. In realising that this solution was also not sensible they withdrew that proposal and made an alternative proposal to name the taxon Enterobacter aerogenes Hormaeche and Edwards 1960 [1]. The Judicial Commission also rejected the genus name ‘Aerobacter’ Beijerinck 1900 in 1971 [3] and reference to the original Request for an Opinion [4] provides a useful summary on the problems associated with the name ‘Aerobacter aerogenes’. The names ‘Aerobacter’ Beijerinck 1900 and ‘Aerobacter aerogenes’ are also not validly published.

Bascomb et al. [5] published a study of 177 strains that included, among others, members of the genera Klebsiella and Enterobacter, coming to the conclusion that the three species of the genus Enterobacter they studied did not belong in one genus and that strains of Enterobacter aerogenes Hormaeche and Edwards 1960 (including the nomenclatural type deposited as NCTC 10006 as designated by Hormaeche and Edwards [1]) were more appropriately classified in the genus Klebsiella. Consequently, one might have expected Enterobacter aerogenes Hormaeche and Edwards 1960 to be transferred to the genus Klebsiella with the retention of the epithet aerogenes. However, the 1966 revision of the International Code of Nomenclature of Bacteria [6] in Rule 18b would not have permitted such an action since the name ‘Klebsiella aerogenes’ (Kruse) Taylor et al. 1956 was considered to be validly published at the time and it was therefore necessary to create a nomen novum, Klebsiella mobilis Bascomb et al. 1971 based on the same nomenclatural type (NCTC 10006, ATCC 13048) as Enterobacter aerogenes Hormaeche and Edwards 1960 to prevent the creation of a later homonym. Klebsiella mobilis Bascomb et al. 1971 and Enterobacter aerogenes Hormaeche and Edwards 1960 are homotypic synonyms [5].

With the publication of the Approved Lists [7, 8] the name ‘Klebsiella aerogenes’ (Kruse) Taylor et al. 1956 was not

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included and is consequently not validly published under the 1975, 1990 and 2008 revisions of the Code [9–11]. In the absence of a potentially validly published homonym for the name Klebsiella aerogenes there is no obstacle to the use of the name Klebsiella aerogenes based on the nomenclatural type (NCTC 10006, ATCC 13048) and for which Enterobacter aerogenes Hormaeche and Edwards 1960 would be the basonym. The Rules of the 1975, 1990 and 2008 revisions of the Code [9–11] determine what is to happen when Enterobacter aerogenes Hormaeche and Edwards 1960 is transferred to the genus Klebsiella and what would happen to a nomen novum, such as Klebsiella mobilis Bascomb et al. 1971 should it be transferred to a different genus in which the epithet aerogenes would not be duplicated; the epithet is to be re-established (Rule 41a). In the present instance, one can only infer what should have happened when, under the Rules of the 1975, 1990 and 2008 [9–11] revisions of the Code Enterobacter aerogenes Hormaeche and Edwards 1960 is transferred to the genus Klebsiella, based on the same nomenclatural type, a new combination would be created, Klebsiella aerogenes (Hormaeche and Edwards 1960). Despite inclusion of the name Klebsiella mobilis Bascomb et al. 1971 on the Approved Lists, the Rules of the 1975 revision of the Code in force at the time and all subsequent revisions [9–11] require that the epithet aerogenes be used (Rule 23a; 41a), and that the use of the epithet mobilis is illegitimate [Rule 51b (2)] and must be replaced by the oldest legitimate epithet (Rule 54). It should of course be remembered that at the time up to the inclusion of the names Enterobacter aerogenes Hormaeche and Edwards 1960 and Klebsiella mobilis Bascomb et al. 1971 on the Approved Lists 1980 [7], the name ‘Klebsiella aerogenes’ (Kruse) Taylor et al. 1956 was considered to be validly published and that the combination Klebsiella aerogenes (Hormaeche and Edwards 1960) could only have been created on or after the publication of the Approved Lists in 1980 [7]. A consequence of this action is that the combination Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) remains validly published, but due to the illegitimate status of the epithet mobilis may not be used. However, as a validly published combination Klebsiella mobilis may not be used at the rank of species within the genus Klebsiella based on a different type and the epithet mobilis may also not be used at the rank of subspecies within the genus Klebsiella.

Given the fact that the epithet mobilis in Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) is illegitimate and that the combination required by the Code, Klebsiella aerogenes (Hormaeche and Edwards 1960) has never been validly published, a formal proposal is given below. In making this proposal attention needs to be drawn to the fact that literature prior to the publication of the name Klebsiella aerogenes (Hormaeche and Edwards 1960) that uses the name Klebsiella aerogenes without reference to the authors or a nomenclatural type may be referring to ‘Klebsiella aerogenes’ (Kruse) Taylor et al. 1956. This species, whose name is no longer considered to be validly published, with a nomenclatural type as designated by Cowan et al. [12], is considered to be a member of the taxon Klebsiella pneumoniae subsp. pneumoniae [13].

**KLEBSIELLA AEROGENES (HORMAECH AND EDWARDS 1960) COMB. NOV.**

Non ‘Klebsiella aerogenes’ (Kruse) Taylor et al. 1956.

**Synonyms:**

Homotypic: Enterobacter aerogenes Hormaeche and Edwards 1960 (basonym); Klebsiella mobilis Bascomb et al. 1971 (Approved Lists 1980) in which the epithet mobilis is illegitimate and is to be replaced by the epithet aerogenes.

The properties are as given in Bascomb et al. [5] for Klebsiella mobilis. The G+C content determined by whole-genome sequencing of the DNA of the strain held in the Korean Collection for Type Cultures as KCTC 2190T is 54.8 mol% [14]. The genome sequence of this strain has been deposited in the GenBank database under the accession number CP002824. The 16S rRNA gene sequence as determined by Harada et al. [15] for JCM 1235T has been deposited in the GenBank database under the accession number AB004750 and that extracted from the genome sequence CP002824:220898–221642 as NR_102493. The fatty acid composition is given in the supplementary data to Saha et al. [16] under Enterobacter aerogenes ATCC 13048T, but are given here since supplementary data is not an effective publication (percentage composition rounded to one decimal place and given as a guide to the relative concentrations only): C12:0 (1.5%), C14:0 (9.4%), C14:0 2-OH (1.0%), C16:0 (30.7%), C17:0 Cyclo (8.2%), C19:0 Cyclo ω8c (1.2%), C14:0 3-OH/iso-C16:1 I (probably C14:0 3-OH) (8.7%), C16:1ω7c/C16:1ω6c (probably C16:1ω7c) (16.5%), and C18:1ω6c/C18:1ω7c (probably 18:1 ω7c) (22.0%).

The nomenclatural type for which evidence was presented that the deposits are available is NCTC 10006T (=ATCC 13048T=DSM 30053T=JCM 1235T). Other deposits are also documented.

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**Conflicts of interest**

The author B. J. T. is employed by an organisation that commercially carries out this work.

**References**


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