ᑲᓇᑕᒥ ᖃᐅᔨᓴᖅᑏᑦ ᐅᖃᐅᔾᔨᒋᐊᖅᑏᑦ ᐊᔾᓚᒡᕕᖓᑦ

ᓇᐃᓈᖅᓯᒪᔪᑦ ᑐᓴᐅᒪᔭᐅᔭᕆᐊᓖᑦ ᐅᕙᓐᖓᑦ ᐱᓯᒪᔪᑦ:

ᖃᐅᔨᓴᕐᓂᐅᓚᐅᖅᑐᒥᒃ ᐅᓂᒃᑳᑦ 2003/080
ᐆᒪ ᐅᓂᒃᑳᓕᐊᑦ ᐃᓗᓕᖏᑦ ᐊᔾᔨᓕᐅᕋᒃᓴᐅᓐᖏᑦᑐᑦ ᑎᑎᕋᖅᓯᒪᔪᓄᑦ ᐊᖏᖅᑕᐅᓯᒪᓐᖏᑦᑐᓄᑦ

ᐊᖏᒍᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᐊᓪᓚᓐᖑᐊᑦ (Monodon monoceros) ᑲᓇᑕᒥ ᐊᒻᒪ ᐊᑯᑭᑦᑐᑦ ᐅᐊᓐᓇᖓᓂ (1982-2001)

B.G.E. de March, D.A. Tenkula, and L.D. Postma

ᑕᕆᐅᖑᓐᖏᑦᑐᒥ ᖃᐅᔨᓴᖅᑏᑦ, ᐃᒪᕐᒥᐅᑕᓕᕆᔨᒃᑯᑦ ᑲᓇᑕᒥ
501 University Crescent
Winnipeg R3T 2N6

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ᐅᓂᒃᑳᓕᐊᑦ ᐃᓗᓕᖏᑦ

ᕿᒥᕐᕈᓇᓚᐅᖅᑐᒍ ᐊᐅᖏᒍᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ 433-ᓂᒃ ᐊᓪᓚᓐᖑᐊᓂᒃ, ᓄᐊᑦᑎᓚᐅᖅᑕᑦᑎᓐᓂᒃ 1982 ᐊᒻᒪ 2001 ᐊᑯᓐᓂᖓᓂ, ᕿᓚᓗᒐᕐᓂᐊᖅᑕᐅᓯᒪᔪᓂᑦ 12-ᓂᒃ ᓄᓇᕗᒻᒥ ᓄᓇᓕᖕᓂᑦ ᑲᓇᑕᒥ, ᐊᒻᒪ ᒪᕐᕉᖕᓂᒃ ᓄᓇᓕᖕᓂᑦ ᐊᑯᑭᑦᑐᒥᐅᓂᑦ. ᓄᐊᑦᑎᕕᒋᓚᐅᖅᑕᕗᑦ ᑲᓇᑕᒥ ᓇᐅᔮᓂ, ᖃᐅᓱᐃᑦᑐᒥ, ᕿᑭᖅᑕᕐᔪᐊᒥ, ᒥᑦᑎᒪᑕᓕᖕᒥ, ᐊᒻᒪ ᐃᑉᐱᐊᕐᔪᖕᒥ. ᐊᓪᓚᓐᖑᐊᑦ ᓇᐅᔮᓂ ᐊᔾᔨᐅᓐᖏᓛᖑᓚᐅᖅᐳᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ ᖁᑦᑎᒃᑐᒥ ᐊᓪᓚᓐᖑᐊᖁᑎᖏᓐᓂᑦ ᐊᐅᖏᓐᓂ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓂ ᐊᓈᓇᖏᓐᓃᓐᖔᖅᓯᒪᓂᖏᓐᓂᒡᓗ. ᐊᓪᓚᓐᖑᐊᑦ ᐃᒡᓗᓕᖕᒥ ᐱᔭᐅᕙᒃᑐᑦ ᐊᔾᔨᐅᑦᑎᐊᓐᖏᑐᐃᓐᓇᕐᓂᖃᓚᐅᖅᐳᑦ ᐊᓯᖏᓐᓂᒃ ᐱᔭᐅᕙᒃᑐᓂᒃ ᐊᒻᒪ ᖃᓂᒋᔭᖃᕐᓂᖅᓴᐅᓪᓗᑎᒃ ᖁᑦᑎᒃᑐᒥᐅᓂᒃ, ᐊᔾᔨᖃᓐᖏᓐᓂᖅᓴᐅᓪᓗᑎᒃ ᑕᓯᐅᔭᕐᔪᐊᒥᐅᓂᒃ ᐊᓪᓚᓐᖑᐊᓂᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᖃᐅᓱᐃᑦᑐᒥ ᐊᔾᔨᖃᕐᓂᖅᓴᐅᓚᐅᖅᐳᑦ ᐊᑯᑭᑦᑐᒥᐅᓂᒃ ᐊᒻᒪ ᐊᔾᔨᐅᑦᑎᐊᓐᖏᑐᐃᓐᓇᕐᓂᖃᖅᑐᑎᒃ ᐊᓯᖏᓐᓂᒃ ᐱᓇᓱᐊᕐᕕᐅᕙᒃᑐᓂᒃ. ᑭᓯᐊᓂᓕ ᖁᑦᑎᒃᑐᒥᐅᑦ ᐃᓚᒌᖏᓐᓇᐸᓘᓚᐅᖅᐳᑦ ᑲᓇᑕᒥ. ᐊᓪᓚᓐᖑᐊᑦ ᐆᒻᒪᓇᕐᒥᐅᑦ ᐊᑯᑭᑦᑐᒥ ᐊᔾᔨᒋᓚᐅᓐᖏᓚᐃᑦ ᑲᓇᑕᒥ ᐱᔭᐅᕙᒃᑐᓂᒃ. ᑖᒃᑯᐊ ᐃᓚᒌᖕᓂᖏᑦ ᐱᓯᒪᔪᒃᓴᐅᕗᑦ ᐃᓚᒌᓗᐊᖅᑐᑦ ᕿᑐᓐᖓᖅᑖᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᓲᖃᐃᒻᒪ ᐊᓪᓚᓐᖑᐊᑦ ᖃᑦᓰᓐᓇᑯᓗᖕᓂᒃ ᐱᒋᐊᖅᓯᒪᖕᒪᑕ ᓯᕗᓕᖏᓐᓂᑦ.

ᖃᐅᔨᕙᓪᓕᐊᓯᒪᔭᕗᑦ ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐲᖅᓯᓐᖏᓚᑦ ᐊᒡᒍᖅᑕᐅᓯᒪᓂᖏᓐᓂᒃ ᑲᒪᒋᔭᐅᓂᖏᓐᓄᑦ ᑕᐃᒪᐃᓕᐅᖅᑕᐅᓯᒪᔪᓂᒃ. ᑕᐃᒃᑯᐊ ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ (de March and Stern 2003) ᐊᒡᒍᖅᑕᐅᓯᒪᓂᖏᓐᓂᒃ ᓱᓕᓂᖅᓴᐅᕗᑦ, ᐱᓗᐊᖅᑐᒥᒃ ᖃᐅᓱᐃᑦᑐᒥ, ᒥᑦᑎᒪᑕᓕᖕᒥ, ᕿᑭᖅᑕᕐᔪᐊᒥ ᐊᒻᒪ ᓇᐅᔮᓂ ᐱᑕᖃᕐᓂᖏᓐᓂᒃ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᓴᖅᑭᑎᑦᑎᓚᐅᕐᒪᑕ ᐊᒡᒍᖅᓯᒪᓪᓚᑦᑖᕐᓂᖏᓐᓂᒃ.

ᖃᐅᔨᓴᕈᓐᓇᖅᑕᕗᑦ ᐊᒥᓲᓂᖅᓴᐅᒃᐸᑕ, ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᖃᐅᔨᑦᑎᐊᒃᑲᓐᓂᕈᓐᓇᖅᑐᒃᓴᐅᕗᒍᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᑕ ᐃᓚᒌᓐᖏᓐᓂᖏᓐᓂᒃ. ᑭᓯᐊᓂᓕ ᓇᓚᐅᑦᑖᕈᓐᓇᖅᐳᒍᑦ ᑖᒃᑯᐊ ᖃᐅᔨᓴᖅᑕᕗᑦ ᐊᒥᓲᒐᓗᐊᖅᐸᑕ, ᐃᓚᒌᖕᓂᖏᑦ ᑕᕝᕙᓐᖔᖃᑎᒌᖕᓂᖅᓴᐅᒐᔭᖅᑐᑦ ᐊᒡᒍᖅᓯᒪᒐᓗᐊᖅᐸᑕ, ᐊᒻᒪ ᐊᕐᕌᒍᒥᑦ ᐊᕐᕌᒍᒧᑦ ᐊᔾᔨᖅᐸᓪᓕᐊᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᓈᓴᐃᓂᕐᒧᑦ
ᓇᓗᓇᓐᖏᓚᑦ.

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ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᓂᒃ ᐅᖃᐅᓯᖃᕐᓂᖅ

ᑖᒃᑯᐊ ᖃᐅᔨᓴᓚᐅᖅᑕᑦᑕ ᐃᓚᒌᖕᓂᖏᑦ ᖃᐅᔨᔾᔪᑎᒋᓚᐅᖅᐸᕗᑦ ᐊᒡᒍᖅᓯᒪᓪᓚᑦᑖᕐᓂᖏᓐᓂᒃ. ᖃᐅᓯᓴᕐᓂᕆᓚᐅᖅᑕᕗᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ (de March and Stern 2003) ᓂᕆᐅᒋᔪᓐᓇᖅᑕᕗᑦ ᓴᖅᑭᓗᐊᓚᐅᓐᖏᓚᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᓇᓗᓇᐃᖅᓯᕕᒃᓴᐅᑦᑎᐊᕋᔭᓐᖏᓚᖅ ᐊᒡᒍᖅᓯᒪᓂᖏᓐᓂᒃ ᓇᒥ ᐱᓯᒪᓂᖏᓐᓄᑦ.

ᖃᐅᔨᕙᓪᓕᐊᔭᕗᑦ ᓇᓗᓇᐃᖅᓯᓯᒪᕗᑦ ᒪᕐᕈᐃᓕᖓᓂᖏᓐᓂᒃ ᐊᐅᒃᑯᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ (de March 2002b). ᖃᐅᔨᓴᕐᓂᐅᓚᐅᖅᑐᖅ ᐆᕕᖓ ᐅᓂᒃᑳᓕᐊᖑᓯᒪᔪᓂᒃ de March (2002b) ᐊᒥᓲᓂᖅᓴᓂᒃ ᖃᐅᔨᓴᕈᓐᓇᓚᐅᖅᐳᑦ ᐊᒻᒪ ᓇᓂᓯᔪᓐᓇᓚᐅᖅᐳᖅ ᐱᖓᔪᐊᓐᓄᑦ ᐊᒻᒪ ᐊᕐᕕᓂᓕᖓᓄᑦ ᐊᐅᒃᑯᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ ᑖᒃᑯᐊ ᐊᒡᒍᖅᓯᒪᔪᑦ. ᑖᒃᑯᐊ ᐊᐅᒃᑯᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᓖᑦ ᑕᑯᔭᐅᖃᑦᑕᓚᐅᖅᐳᑦ 10%-ᖏᓐᓂ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ.

ᖃᐅᔨᓴᕐᓂᕗᑦ M ᓇᓗᓇᐃᒃᑯᑕᓕᖕᓂᒃ N ᓇᓗᓇᐃᒃᑯᑕᐅᓐᖏᑦᑐᓂᒃ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ ᐊᑦᑐᐃᓂᖃᓚᐅᖅᐳᑦ ᖃᐅᔨᓴᕐᓂᑦᑎᓐᓄᑦ. ᐊᔾᔨᒋᔭᐅᒐᔪᓛᖅ ᐊᐅᒃᑯᑦ ᓇᓗᓇᐃᒃᑯᑕᖅ (N01) ᐊᒡᒍᖅᑐᕋᒃᓴᐅᕗᖅ M ᓇᓗᓇᐃᒃᑯᑕᓕᖕᓄᑦ. ᑖᒃᑯᓇᓐᖓᑦ ᑎᓴᒪᐅᔪᓂᑦ ᐊᑕᐅᓯᖅ M ᓇᓗᓇᐃᒃᑯᑕᓖᑦ ᖃᐅᔨᔭᒃᓴᐅᓚᐅᖅᐳᑦ ᐊᔾᔨᒌᒍᑕᐅᔪᑦ (M01, 212/216 ᓴᖅᑭᓲᑦ N01), ᐊᒻᒪ ᐱᖓᓱᑦ ᓴᖅᑭᒐᔪᒪᐅᓐᖏᑦᑐᑦ (M12, 2/216; M13 ᐊᒻᒪ M21, ᐊᑕᐅᓯᐊᖅᓯᒪᑐᐃᓐᓇᓚᐅᖅᑐᑦ). ᖃᐅᔨᓴᕐᓂᖅ mtDNA-ᒥᒃ ᐱᑦᑎᐊᕈᑕᐅᓯᒪᕗᖅ ᖃᑯᖅᑕᓄᑦ ᕿᓚᓗᒐᕐᓄᑦ ᑖᒃᑯᐊ ᐊᑕᐅᓯᐅᓐᖏᑦᑐᑦ ᐊᐅᒃᑯᑦ ᐃᓚᒌᒍᑕᐅᔪᑦ ᐊᒡᒍᕋᒃᓴᐅᓚᐅᕐᒪᑕ ᓄᑖᓐᖑᖅᓯᒪᔪᓄᑦ ᓴᖅᑭᒐᔪᒃᑐᓄᑦ, ᑖᒃᑯᐊᓗ ᐊᒡᒍᖅᓯᒪᔪᓄᑦ ᐊᑕᓕᖅᑎᑕᐅᔪᓐᓇᓚᐅᕐᒪᑕ (de March, ᖃᐅᔨᓴᓚᐅᖅᑕᖏᑦ ᓴᖅᑭᑕᐅᓯᒪᓐᖏᑦᑐᑦ ᓱᓕ). ᐊᓪᓚᓐᖑᐊᓄᓪᓕ ᑕᐃᒪᐃᓕᐅᕈᓐᓇᓗᐊᓚᐅᓐᖏᓚᒍᑦ.

ᐊᔾᔨᐅᓐᖏᓛᖑᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓂ ᓇᐅᔮᓂ ᐱᓯᒪᓚᐅᖅᐳᑦ ᓯᓂᓕᕇᒃᑎᑕᐅᓂᖏᓐᓄᑦ ᑲᓇᑕᒥ ᐊᒡᒍᖅᓯᒪᔪᓄᑦ. ᑖᒃᑯᐊ ᖃᐅᔨᕚᓪᓕᓚᐅᖅᑕᕗᑦ ᓴᖅᑭᑎᑦᑎᑲᓐᓂᖅᐳᑦ ᐃᓱᒪᓕᐊᖑᓯᒪᔪᓂᒃ. ᓇᐅᔮᓂ ᖃᐅᔨᓴᓚᐅᖅᑕᕗᑦ ᐊᒡᒍᖅᓯᒪᔪᓐᓇᖅᐳᑦ Mm001:Mm002 ᓇᓗᓇᐃᒃᑯᑕᖏᑦ ᐊᑐᕐᓗᒋᑦ ᐅᐱᕐᓇᕕᖕᒥᑦ ᐊᑯᑭᑦᑐᒥᐅᓂᑦ, ᑭᓯᐊᓂᓕ ᖃᐅᔨᔾᔪᑎᒋᓚᐅᕆᕙᕗᑦ ᐊᐅᖏᒍᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᓇᐅᔮᒥᐅᓂᒃ.

ᐊᓯᖏᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᓐᓂᒃ ᑲᖐᒋᔭᐅᓯᒪᔪᑦ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᕆᕗᑦ ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ. ᑲᖐᓇᖅᐳᖅ ᐊᓪᓚᓐᖑᐊᖅᑕᐅᕙᒃᑐᑦ ᐃᒡᓗᓕᖕᒥ, ᓄᐊᑕᐅᓚᐅᖅᑐᑦ ᐋᒡᒌᓯᒦᓐᓇᖅ, ᖁᑦᑎᒃᑐᒥᐅᖏᓐᓴᐅᓂᖏᓐᓂᒃ, ᑕᓯᐅᔭᕐᔪᐊᒦᓐᖔᖅᓯᒪᓐᖏᑦᑐᑦ. ᓇᓗᓇᐃᒃᑯᑕᖅ N01:N02 ᐃᒡᓗᓕᖕᒥ ᖃᓂᒋᔭᖃᕐᓂᖅᓴᐅᕗᑦ ᖁᑦᑎᒃᑐᒥᐅᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᒥᐅᓂᒃ ᐅᖓᓯᖕᓂᖅᓴᐅᓪᓗᑎᒃ, ᐊᒻᒪ ᓇᓗᓇᐃᒃᑯᑕᕐᒥᒃ N06 ᓇᓂᓯᓚᐅᕆᕗᒍᑦ, ᑖᒃᑯᐊ ᖁᑦᑎᒃᑐᒥᐅᓂ ᑭᓯᐊᓂ ᓇᓂᔭᐅᓲᖅ. ᐊᐅᒃᑯᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ ᖃᐅᔨᒪᕈᑏᑦ ᐃᒡᓗᓕᖕᒥ ᐱᓚᐅᖅᑐᓂᒃ ᐊᒻᒪ ᐊᓯᖏᓐᓂᑦ ᖃᐅᔨᒪᓇᕆᕗᑦ ᑖᒃᑯᐊ ᖁᑦᑎᒃᑐᒥᐅᓂᑦ ᐱᓯᒪᓂᖏᓐᓂᒃ. ᐊᒻᒪᑦᑕᐅᖅ, ᑖᒃᑯᐊ ᖁᑦᑎᒃᑐᒨᖃᑦᑕᖅᑐᑦ ᐊᓯᖏᓐᓂᒃ ᐱᑕᖃᓲᖑᕙᓪᓚᐃᓂᖏᓐᓂᒃ, ᐱᑕᖃᓛᖑᓪᓗᓂ ᖃᐅᓱᐃᑦᑐᒥᐅᓂᑦ (N01:N02:N06:N08 ᐊᒥᒨᓂᖃᕐᓗᑎᒃ 22:2:0:9) ᐊᒻᒪ ᕿᑭᖅᑕᕐᔪᐊᒥ (N01:N02:N06:N08 ᐊᒥᒨᓂᖃᕐᓗᑎᒃ 28:11:6:0).

ᐃᓚᒌᓐᖏᒐᔪᖕᓂᖅᓴᐅᕗᑦ ᐊᑯᑭᑦᑐᒥᐅᑦ ᕿᒥᕐᕈᓇᒃᑕᐅᓚᐅᖅᑐᑦ Palsbøll et al. (1996) ᑲᓇᑕᐅᑉ ᖁᑦᑎᒃᑐᖓᓃᑦᑐᓂᒃ. ᑭᓯᐊᓂᓕ, ᖃᐅᔨᓴᕐᓂᑦᑎᒍᑦ ᐊᐱᖅᑯᑎᒃᓴᒃᑲᓐᓂᕐᓂᒃ ᓴᖅᑭᑎᑦᑎᕗᒍᑦ ᐊᑯᑭᑦᑐᒥᐅᓂᒃ ᐊᓪᓚᓐᖑᐊᓂᒃ. 12 ᖃᐅᔨᓴᓚᐅᖅᑕᕗᑦ ᖄᓈᕐᒥ ᐊᕙᓂᖅᓱᐊᒥ 12/12-ᖑᓚᐅᖅᐳᑦ Mm001-ᒥᒃ, ᑖᒃᑯᐊ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ Palsbøll et al. (1996) 126/173-ᖑᓚᐅᖅᑎᓪᓗᒋᑦ Mm001 (73%). ᖃᐅᔨᓴᓚᐅᖅᑕᕗᑦ ᓂᕈᐊᖅᑕᐅᓯᒪᓚᐅᖅᐳᑦ ᐊᒥᓱᒐᓚᖕᓂᑦ, ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᓂᕈᐊᓚᐅᖅᑕᕗᑦ ᓇᓕᖅᑯᒃᓯᒪᑐᐃᓐᓇᕋᔭᓐᖑᐊᓐᖏᓚᑦ 11-ᓂᒃ ᐊᐅᓕᖕᓂᒃ ᐊᔾᔨᒌᐸᓗᖕᓂᒃ. ᐊᕐᕌᒍᒥᑦ ᐊᕐᕌᒍᒧᑦ ᐊᓯᕈᖅᑕᒐᓚᒃᑐᒃᓴᐅᕙᒃᐳᑦ ᑖᒃᑯᓇᓐᖓᑦ ᐱᓯᒪᔪᑦ.

ᐊᐅᒃᑯᑦ ᐃᓚᒌᓐᖏᓐᓂᖃᕐᓂᖏᑦ ᑲᓇᑕᒥ ᐊᑯᑭᑦᑐᒥᐅᓄᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑕᐅᒐᔭᖅᐳᖅ ᐱᓇᓱᐊᖅᑕᐅᓗᐊᓐᖏᓐᓂᖅᓴᐅᓂᖏᓐᓂᒃ ᐊᓪᓚᓐᖑᐊᖁᑎᑦᑕ. ᐅᕝᕙᓗᑭᐊᖅ ᑲᓇᑕᒥ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᒥᓲᓂᖅᓴᐅᓚᐅᕐᓂᖏᓐᓂᒃ ᐊᑯᑭᑦᑐᒥ ᐱᓯᒪᔪᓂᒃ.

ᑖᒃᑯᐊ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑕᐅᒃᑲᓐᓂᖅᐳᑦ ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᓂᒃ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ (de March ᐊᒻᒪ Stern, 2003). ᑕᐃᑲᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ ᓇᓗᓇᐃᖅᓯᔪᓐᓇᓚᐅᖅᐳᒍᑦ ᐊᓪᓚᓐᖑᐊᑦ ᓇᐅᔮᓂ, ᒥᑦᑎᒪᑕᓕᖕᒥ, ᐊᐅᓱᐃᑦᑐᒥ, ᐊᒻᒪ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐊᒡᒍᖅᓯᒪᓪᓚᑦᑖᕐᓂᖏᓐᓂᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᐱᓯᒪᔪᑦ ᐸᓐᓂᖅᑑᒥ ᐱᓯᒪᔪᒃᓴᐅᓚᐅᖅᐳᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐱᓯᒪᔪᓂᒃ. ᐊᒡᒍᖅᓯᒪᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᐅᑕᐅᓚᐅᖅᑐᑦ ᓴᖅᑭᔮᖅᑎᑦᑎᓂᖅᓴᐅᓚᐅᖅᐳᑦ ᐊᐅᖏᒍᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᐅᑕᐅᔪᓂᒃ, ᑭᓯᐊᓂ ᑕᐃᑲᓂ ᖃᐅᔨᕚᓪᓕᕈᑎᖃᓚᐅᕆᕗᒍᑦ ᐊᔾᔨᒌᕈᔪᖕᓂᖏᓐᓂᒃ. ᐅᔾᔨᕐᓇᕆᕗᑦᑕᐅᖅ ᖃᑯᑦᑕᐃᑦ ᐊᐅᔭᒃᑯᑦ ᑕᓯᐅᔭᕐᔪᐊᒦᒃᐸᑦᑐᑦ ᐊᔾᔨᐸᓗᖏᓐᓂᒃ DDD/PCB-ᖃᖅᐳᑦ ᓇᐅᔮᓂ ᐊᓪᓚᓐᖑᐊᖏᑕ (de March et al. ᓴᖅᑭᑕᐅᔪᒃᓴᑦ ᓱᓕ).

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ᐊᑐᖃᑦᑕᕐᓂᖏᑦ ᐊᒻᒪ ᓅᖃᑦᑕᕐᓂᖏᑦ ᐊᓪᓚᓐᖑᐊᑦ ᑐᑭᓯᔭᐅᑦᑎᐊᖅᓯᒪᓐᖏᓚᑦ ᓱᓕ ᐊᒻᒪ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᑐᑭᓯᑦᑎᐊᓐᖏᔾᔪᑕᐅᔪᓐᓇᖅᐳᑦ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓄᑦ. ᖃᐅᔨᒪᒐᓗᐊᖅᑐᑕ ᑕᕝᕙ ᑖᒃᑯᐊᑦᓴᐃᓐᓇᐃᑦ ᐅᐸᒐᔪᒃᑕᖏᓐᓄᑦ ᐅᑎᖅᑕᖃᑦᑕᕐᓂᖏᓐᓂᒃ ᐊᐅᔭᑕᒫᖅ, ᖃᐅᔨᒪᑦᑎᐊᓐᖏᓚᒍᑦ ᑖᒃᑯᐊ ᐅᑭᐅᒃᑯᑦ ᐊᕕᒃᑐᖅᐸᒃᑐᑦ ᕿᑐᓐᖏᐅᖃᑎᒌᖃᑦᑕᕐᒪᖔᑕ ᐊᓯᖏᓐᓄᑦ. ᐊᔾᔨᒌᐸᓗᖕᓂᖏᑦ ᐊᐅᒃᑯᑦ ᐃᓚᒋᖕᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᕗᑦ ᖁᑦᑎᒃᑐᒥᐅᑦ ᕿᑐᓐᖏᐅᖃᑎᒌᖃᑦᑕᖅᑐᒃᓴᐅᓂᖏᓐᓂᒃ ᐊᓯᖏᓐᓂᒃ ᐅᑭᐅᒃᑯᑦ ᐊᒻᒪ ᐅᐱᕐᖓᒃᓵᒃᑯᑦ ᓅᓕᖅᑎᓪᓗᒋᑦ ᐊᐅᔭᒃᑯᑦ ᐃᓂᒋᕙᒃᑕᖏᓐᓄᑦ. ᑭᓯᐊᓂᓕ ᑖᒃᑯᐊ ᐃᓚᒌᖕᓂᖃᕆᕗᑦ ᐊᓈᓇᖏᒍᑦ ᑖᒃᑯᐊ ᐅᑎᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᑕᐅᕗᖓᑦᓴᐃᓐᓇᖅ ᐊᐅᔭᒃᑯᑦ.

ᐃᓱᒪᒋᔭᐅᓂᖏᓐᓄᑦ ᐊᒡᒍᖅᓯᒪᓪᓚᑦᑖᕐᓂᖏᓐᓂᒃ, ᐊᐱᖅᓱᕆᐊᖃᖅᐳᒍᑦ ᖃᐅᔨᓴᕐᓂᒃᑯᑦ ᓄᐊᑦᑎᑦᑎᐊᖅᓯᒪᒐᓗᐊᕐᒪᖔᑦᑕ ᖃᐅᔨᓴᕈᑎᑦᑎᓐᓂᒃ. ᑭᓯᐊᓂᓕ ᑲᖐᓱᒃᐳᒍᑦ ᓇᓂᓯᔪᓐᓇᓐᖏᓐᓂᑦᑎᓐᓄᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ. 1) ᐊᔾᔨᒌᓐᖏᑦᑐᓂᒃ ᖃᐅᔨᓴᕈᑎᖃᖅᐳᒍᑦ ᐃᓚᒌᖕᓂᖏᓐᓂᒃ, ᐊᐅᖏᒍᑦ ᒪᑯᓂᖓ microsateliite loci. ᑖᒃᑯᐊ ᕿᑐᓐᖏᐅᓂᒃᑯᑦ ᐊᔾᔨᒌᓂᒃ ᓴᖅᑭᑎᑦᑎᕙᒃᐸᑕ ᖃᐅᔨᓴᕈᑎᑦᑎᒍᑦ ᓇᓗᓇᐃᕈᓐᓇᖅᐳᑦ. 2) ᑖᒃᑯᐊ ᖃᐅᔨᓴᕈᑎᒋᔭᕗᑦ ᐊᐅᖏᓐᓂᒃ ᐊᑐᓚᐅᕐᒥᔭᕗᑦ ᖃᑯᖅᑕᓄᑦ, ᑖᒃᑯᐊᓗ ᐃᓚᒌᓐᖏᓐᓂᖃᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐊᓪᓚᓐᖑᐊᓂᒃ. ᖃᐅᔨᓴᕈᑎᕗᑦ EV37 ᐊᒻᒪ FCB 17 ᖃᐅᔨᓴᕈᑎᑦᑎᐊᕚᖑᓚᐅᖅᐳᑦ ᖃᑯᑦᑕᓄᑦ, ᐊᒻᒪ ᑕᐃᒪᐃᒃᑲᔭᓐᖑᐊᕆᕗᑦ ᐊᓪᓚᓐᖑᐊᓄᑦ (ᐃᓕᐅᖅᑲᖅᓯᒪᔪᑦ 2 ᑕᑯᓂᐊᕐᓗᒍ). ᐊᒻᒪᑦᑕᐅᖅ, ᐊᑐᓚᐅᖅᐳᒍᑦ ᐊᐅᖕᒥᒃ ᖃᐅᔨᓴᕈᑎᑦᑎᓐᓂᒃ ᐊᐃᕕᕐᓄᑦ ᐊᒻᒪ ᐊᕐᕕᓄᑦ, ᐊᒻᒪ ᑖᒃᑯᓂᖓ ᖃᐅᔨᓚᐅᖅᐳᒍᑦ ᐃᓚᒌᓐᖏᓐᓂᖃᕐᓂᖏᓐᓂᒃ ᐊᒡᒍᖅᓯᒪᔪᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖃᐅᕐᓂᖅᓴᐅᓪᓗᑎᒃ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᐅᖃᕈᓐᓇᖅᐳᒍᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᑦ ᐊᓪᓚᓐᖑᐊᑦ ᐃᓚᒌᓐᖏᖅᓴᐅᓂᖏᓐᓂᒃ ᐊᐅᖏᒍᑦ.