ᑲᓇᑕᒥ ᖃᐅᔨᓴᖅᑏᑦ ᐅᖃᐅᔾᔨᒋᐊᖅᑏᑦ ᐊᔾᓚᒡᕕᖓᑦ

ᓇᐃᓈᖅᓯᒪᔪᑦ ᑐᓴᐅᒪᔭᐅᔭᕆᐊᓖᑦ ᐅᕙᓐᖓᑦ ᐱᓯᒪᔪᑦ:

ᖃᐅᔨᓴᕐᓂᐅᓚᐅᖅᑐᒥᒃ ᐅᓂᒃᑳᑦ 2003/079
ᐆᒪ ᐅᓂᒃᑳᓕᐊᑦ ᐃᓗᓕᖏᑦ ᐊᔾᔨᓕᐅᕋᒃᓴᐅᓐᖏᑦᑐᑦ ᑎᑎᕋᖅᓯᒪᔪᓄᑦ ᐊᖏᖅᑕᐅᓯᒪᓐᖏᑦᑐᓄᑦ

ᐊᒡᒍᖅᑕᐅᓯᒪᓂᖏᑦ ᐊᓪᓚᓐᖑᐊᑦ (Monodon monoceros) ᑲᓇᑕᒥ ᒪᓕᒡᓗᒋᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓄᑦ ᐃᒪᕐᒧᑦ ᓱᕈᖅᑎᑕᐅᓯᒪᓂᖏᑦ ᑎᒥᖏᑦ

B.G.E. de March and G. Stern

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

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ᐅᓂᒃᑳᓕᐊᑦ ᐃᓗᓕᖏᑦ

ᐅᓇ ᐅᓂᒃᑳᓕᐊᖑᓯᒪᔪᖅ ᐅᖃᐅᑎᖃᖅᓯᒪᕗᖅ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓄᑦ ᐃᒥᕐᒧᑦ ᓱᕈᕈᑕᐅᓯᒪᓂᖏᓐᓂᒃ ᐊᓪᓚᓐᖑᐊᑦ ᑎᒥᖏᓐᓂ, ᑕᒪᓐᓇ ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᑦ ᐊᓪᓚᓐᖑᐊᑦ ᖃᓄᖅ ᐊᒡᒍᖅᓯᒪᔭᕆᐊᖃᕐᒪᖔᑕ ᖃᐅᔨᓴᖅᑕᐅᑎᓪᓗᒋᑦ, ᓈᓴᖅᑕᐅᓯᒪᔪᓂᑦ ᐋᒡᒋᓯ
2003-ᒥ.

ᓈᓴᐃᔾᔪᑎᑦ ᐊᒡᒍᖅᓯᒪᔾᔪᑎᒃᓴᓂᒃ ᐊᑐᖅᑐᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓂᒃ ᐃᒪᕐᒧᑦ (14 OC) ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᐳᑦ ᐊᓪᓚᓐᖑᐊᕐᓂᐊᖅᑕᐅᕙᒃᑐᓂᒃ ᓇᐅᔮᓂᑦ, ᕿᑭᖅᑕᕐᔪᐊᒥᑦ, ᒥᑦᑎᒪᑕᓕᖕᒥᑦ ᐊᒻᒪ ᐊᐅᓱᐃᑦᑐᒥᑦ. ᑖᒃᑯᐊ ᓈᓴᐃᔾᔪᑏᑦ ᕿᒥᕐᕈᓇᒍᑕᐅᓪᓗᐊᑕᓚᐅᖅᐳᑦ ᓱᑲᓐᓇᖅᑐᒧᑦ ᐅᒃᓯᒃᓴᐅᑎᓂᒃ (PCB) ᐊᒻᒪ ᖁᐱᕐᕈᐊᕐᔪᓄᑦ ᑐᖁᓴᐅᑎᓂᒃ (DDT). ᑖᒃᑯᐊ ᐊᓪᓚᓐᖑᐊᑦ ᓇᒥᑐᐃᓐᓇᖅ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᓱᕈᖅᓯᒪᓂᖃᖅᑐᐃᓐᓇᐅᒐᓗᐊᖅᑎᓪᓗᒋᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓄᑦ ᐃᒥᕐᒧᑦ, ᖃᐅᔨᒪᓇᓚᐅᖅᐳᖅ ᐊᖏᓂᖏᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ. ᓇᐅᔮᓂ ᐊᓪᓚᓐᖑᐊᑦ ᐊᔾᔨᐅᓐᖏᓐᓂᖅᐹᖑᓚᐅᖅᐳᑦ, ᐃᒥᕐᒧᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᓗᐊᓐᖏᓐᓂᖅᓴᐅᓪᓗᑎᒃ ᑭᓯᐊᓂ PCB/DDT ᐱᑕᖃᕐᓂᖅᓴᐅᓪᓗᑎᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐃᒥᕐᒧᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᒐᓚᓚᐅᖅᐳᑦ ᐊᒻᒪ PCB/DDT ᐊᖏᔪᒐᓚᐅᓪᓗᑎᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᐸᓐᓂᖅᑑᒥ ᐱᓇᓱᐊᖅᑕᐅᕙᒃᑐᑦ ᐃᓚᒋᔭᐅᕗᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐱᓇᓱᐊᖅᑕᐅᕙᒃᑐᓂᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᑲᖏᖅᑐᒑᐱᖕᒥ ᐃᓚᒋᔭᐅᓗᐊᖅᑰᔨᓚᐅᓐᖏᑦᑐᑦ ᐊᒻᒪᓗ ᐊᒡᒍᖅᓯᒪᓗᐊᖅᑰᔨᓇᑎᒃ ᐊᓯᖏᓐᓄᑦ; ᑭᐊᓯᓂ ᑕᐃᒪᐃᖅᑰᔨᓚᐅᖅᑐᒃᓴᐅᕗᖅ ᖃᑦᓰᓐᓇᕈᓗᖕᓂᒃ ᖃᐅᔨᓴᓚᐅᕋᑦᑕ ᑕᐅᕙᓐᖓᑦ 6-ᖏᓐᓇᐅᓚᐅᕐᒪᑕ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ. ᑖᒃᑯᓇᓐᖓᑦ ᑎᓴᒪᐅᓕᖅᓯᒪᔪᓂᒃ, ᐊᓪᓚᓐᖑᐊᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᒻᒪ ᐊᐅᓱᐃᑦᑐᒥ ᐊᔾᔨᒌᓛᖑᓚᐅᖅᐳᑦ. ᑭᓯᐊᓂᓕ, ᐊᓪᓚᓐᖑᐊᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ PCB/DDT-ᓂᒃ ᐱᑕᖃᓗᐊᓐᖏᓐᓂᖅᓴᐅᓚᐅᖅᐳᑦ ᐊᐅᓱᐃᑦᑐᒦᓐᖔᖅᑐᓂᒃ. ᑖᒃᑯᐊ ᓱᕈᖅᓴᐅᑎᓂᒃ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᑲᖐᒋᔭᐅᕗᑦ ᐊᔾᔨᒌᓐᖏᒍᑎᖃᖅᑐᒋᔭᐅᓪᓗᑎᒃ ᓂᕆᕕᒋᕙᒃᑕᖏᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓄᑦ. ᐃᓱᒪᒋᔭᐅᓯᒪᔪᑦ ᐊᒥᓱᒐᓚᐃᑦ, ᖃᐅᔨᓴᖅᑎᓄᑦ ᖃᐅᔨᕙᓪᓕᐊᔭᐅᓯᒪᔪᓪᓗ, ᐊᒻᒪ ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᐳᑦ ᓱᓕᑦᑎᐊᕐᓂᖏᓐᓂᒃ ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥᑦ.

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ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᓂᒃ ᐅᖃᐅᓯᖃᕐᓂᖅ

ᑖᒃᑯᐊᒐᓚᐃᑦ ᐃᓱᒪᓕᐊᖑᓯᒪᔪᑦ ᐊᓪᓚᓐᖑᐊᑦ ᐊᒡᒍᖅᑕᐅᓯᒪᓂᖏᓐᓂᒃ ᓇᓗᓇᐃᖅᓯᕗᑦ ᓱᓕᑦᑎᐊᖅᑐᒥᒃ ᐱᕙᓪᓕᐊᓂᖏᓐᓂᒃ. ᑖᒃᑯᐊ ᐊᒡᒍᖅᓯᒪᑎᑕᐅᔪᑦ ᓇᐅᔮᓂ, ᐊᐅᓱᐃᑦᑐᒥ, ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᒻᒪ ᕿᑭᖅᑖᓘᑉ ᑲᓇᖕᓇᖓᓂ ᐱᖓᓱᐃᓕᖓᔫᔮᖅᐳᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ. ᑖᒃᑯᐊ ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ ᖃᐅᔨᕚᓪᓕᕈᑕᐅᔪᑦ ᓱᕈᖅᓯᒪᓂᖏᓐᓂᒃ ᐊᔾᔨᖃᖅᐳᑦ ᖃᐅᔨᓴᕐᓂᐅᓚᐅᖅᑐᒥᒃ ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᖏᓐᓂᒃ ᓯᑑᐅᑦ ᐊᓯᖏᓐᓄᓪᓗ (Stewart et al. (1995)).

ᐊᓪᓚᓐᖑᐊᑦ ᐱᓇᓱᐊᕐᕕᐅᕙᒃᑐᑦ ᓇᐅᔮᓂ ᐊᔾᔨᐅᓐᖏᓛᖑᓚᐅᖅᐳᑦ ᓱᕈᖅᓴᐃᔾᔪᑎᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᓂᖏᓐᓂᒃ, ᐊᒻᒪ ᐊᕕᒃᑐᖅᓯᒪᓂᖃᖅᐳᑦ ᒪᕐᕉᓕᖓᔪᓂᑦ ᑖᒃᑯᓇᓐᖓ ᐱᖓᓱᓂᒃ ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᓂᒃ ᓈᓴᐃᔾᔪᑎᓂᒃ. ᐊᓪᓚᓐᖑᐊᑦ ᓇᐅᔮᓂ ᐱᑕᖃᓗᐊᓐᖏᓐᓂᖅᓴᐅᓚᐅᖅᐳᑦ ᐃᒥᕐᒧᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓂᒃ ᐊᒻᒪ ᑕᐃᒪᐃᑦᑐᒥ ᐱᑕᖃᕐᓂᖏᑦ ᐊᔾᔨᒋᔭᐅᓚᐅᓐᖏᓚᑦ ᐅᑭᐅᖅᑕᖅᑑᑉ ᖁᑦᑎᖕᓂᖓᓂ ᐱᓯᒪᔪᓂᒃ. ᑖᒃᑯᐊ ᓇᐅᔮᓂ ᐊᓪᓚᓐᖑᐊᖁᑎᖏᑦ ᐊᑯᓂ ᐃᓱᒪᒋᔭᐅᓂᒪᕗᑦ ᐊᒡᒍᖅᓯᒪᓱᕆᔭᐅᓪᓗᑎᒃ ᐊᓯᖏᓐᓂᒃ ᐊᓪᓚᓐᖑᐊᓂᒃ ᐃᓂᒋᕙᒃᑕᖏᑦ ᐊᕕᒃᓯᒪᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᓚᐅᖅᑕᑦᑕ.

ᐊᓪᓚᓐᖑᐊᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐊᔾᔨᒋᔫᔮᓚᐅᓐᖏᓚᐃᑦ ᐊᓪᓚᓐᖑᐊᖏᑕ ᐊᐅᓱᐃᑦᑐᒥ, ᒥᑦᑎᒪᑕᓕᖕᒥ, ᐊᒻᒪ ᓇᐅᔮᓂ ᐱᔭᐅᕙᒃᑐᑦ. ᑖᒃᑯᐊ ᐃᒥᕐᒧᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐱᔭᐅᕙᒃᑐᑦ ᐊᓯᕈᖅᑕᓗᐊᓚᐅᓐᖏᑦᑐᑦ ᐊᕐᕌᒍᒥᑦ ᐊᕐᕌᒍᒧᑦ. ᐊᒻᒪᑦᑕᐅᖅ, ᐊᓪᓚᓐᖑᐊᕐᓂᐊᖅᑕᐅᕙᒃᑐᑦ ᐸᓐᓂᖅᑑᑉ ᑲᖏᖅᑐᕐᔪᐊᖓᓂ ᑖᒃᑯᐊᑦᓴᐃᓐᓇᐅᔫᔮᖅᐳᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐱᔭᐅᕙᒃᑐᓂᒃ ᑖᒃᑯᐊ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᐊᔾᔨᒌᐸᓘᓚᐅᕐᒪᑕ. ᑖᒃᑯᐊ ᓄᓇᓖᑦ ᖃᓂᒌᖕᓂᖏᓐᓄᑦ ᑖᒃᑯᐊᑦᓴᐃᓐᓇᐅᔭᕆᐊᖓ ᐃᓱᒪᓇᕆᕗᖅ. ᐊᓪᓚᓐᖑᐊᑦ ᑲᖏᖅᑐᒑᐱᖕᒥ ᐊᓯᒋᔭᐅᔾᔪᑎᖃᓗᐊᓚᐅᓐᖏᑦᑐᑦ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓂᒃ, ᐊᔾᔨᐸᓗᒋᓪᓗᓂᒋᑦ ᖁᑦᑎᒃᑐᒥᓂᑦ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓂᒃ, ᐱᓚᓗᐊᖅᑐᒥᓪᓗ ᐊᔾᔨᒋᓪᓗᓂᒋᑦ ᖃᐅᔨᓴᖅᑕᑦᑎᓐᓂᒃ ᐸᓐᓂᖅᑑᒥ ᐊᒻᒪ ᕿᑭᖅᑕᕐᔪᐊᒥ. ᑕᕝᕙᓐᖓᑦ ᑲᖏᖅᑐᒑᐱᖕᒥ ᐊᒥᓲᓂᖅᓴᓂᒃ ᖃᐅᔨᓴᕆᐊᖃᖅᐳᒍᑦ ᑐᑭᓯᑦᑎᐊᓚᐅᓐᖏᓐᓂᑦᑎᓐᓂ ᓇᑭᑦ ᐊᓪᓚᓐᖑᐊᑦ ᐱᕙᖕᒪᖔᑕ.

ᐊᓪᓚᓐᖑᐊᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᒻᒪ ᐊᐅᓱᐃᑦᑐᒥ ᐊᔾᔨᒌᓐᖏᑐᐃᓐᓇᕆᐊᓖᑦ ᑭᐊᓯᓂ ᑲᑎᑲᐃᓐᓇᖃᑦᑕᖅᑑᔮᖅᐳᑦ. ᖃᐅᔨᒪᔭᐅᕗᑦ ᐊᓪᓚᓐᖑᐊᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᖅᑯᓵᓲᖑᓂᖏᓐᓂᒃ ᐊᐅᓱᐃᑦᑐᒥ, ᑕᐃᒪᐃᓐᓂᖓᓄᓪᓗ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐱᔭᐅᕙᒃᑐᑦ ᐱᔭᐅᕙᒃᑭᕗᑦ ᐊᐅᓱᐃᑦᑐᒥᐅᓄᑦ. ᑖᒃᑯᐊ ᒪᕐᕉᓕᖓᑎᑕᐅᔪᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᐊᔾᔨᒌᓕᖃᑦᑕᖅᐳᑦ, ᑭᓯᐊᓂ ᑕᒪᓐᓇ ᖃᐅᔨᓯᒪᔭᑦᑎᓐᓄᑦ ᓇᕈᖃᑦᑕᕐᓂᖏᓐᓂᒃ ᓱᓕᓪᓚᕆᒃᑲᓗᐊᕐᒪᖔᑕ ᖃᐅᔨᒪᓇᓐᖏᓚᖅ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᐃᓱᒪᓇᖅᐳᖅ ᐊᐅᓱᐃᑦᑐᒥ ᐱᓇᓱᐊᖃᑦᑕᕐᓂᖏᓐᓂᒃ ᐊᑕᐅᓯᐅᓐᖏᑦᑐᒥᒃ ᐊᒡᒍᖅᓯᒪᔪᓂᒃ, ᐅᕝᕙᓗᑭᐊᖅ ᒥᑦᑎᒪᑕᓕᖕᒦᑉᐸᒃᑐᑦ ᐃᓚᖏᑦ ᐊᐅᓱᐃᑦᑐᒧᑦ ᐊᖅᑯᓵᖃᑦᑕᓐᖏᒋᐊᖏᑦ. ᐊᓪᓚᓐᖑᐊᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐱᓯᒪᓱᒋᔭᐅᕗᑦ ᑲᖏᖅᖢᐊᕐᔪᒃᑰᖃᑦᑕᖅᑐᓂᑦ, ᐊᒻᒪ ᑖᒃᑯᐊ ᐊᐅᓱᐃᑦᑐᒨᖅᐸᒃᑐᑦ ᐊᑯᑭᑦᑐᒧᑦ ᐃᑭᖓᓃᓐᖔᖃᑦᑕᕆᐊᖏ (ᕼᐊᐃᑎ-ᔫᒡᒋᓐᓴᓐ (Heide-Jørgensen) ᐊᓯᖏᓪᓗ ᐅᓂᒃᑳᖏᑦ 2001). ᖃᐅᔨᔪᒪᓇᕋᓗᐊᖅᐳᖅ ᐊᑯᑭᑦᑐᒥᐅᑦ ᐊᓪᓚᓐᖑᐊᖏᓐᓂᒃ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ ᐊᔾᔨᒋᓐᖏᒻᒪᖔᒋᑦ ᐊᐅᓱᐃᑦᑐᒨᖅᐸᒃᑐᑦ.

ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ ᖃᐅᔨᒪᓇᑦᑎᐊᓚᐅᓐᖏᓚᑦ ᓇᒦᖃᑦᑕᕐᓂᖏᓐᓄᑦ (ᐃᓕᐅᖅᑲᖅᓯᒪᔪᑦ 2 ᑕᑯᓂᐊᕐᓗᒋᑦ) ᐊᔾᔨᒌᖃᑦᑕᑦᑎᐊᓚᐅᓐᖏᒻᒪᑕ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᓈᓴᐃᔾᔪᑕᐅᔪᓂᒃ. ᑕᒪᓐᓇ ᐊᔾᔨᒌᑦᑎᐊᓐᖏᓐᓂᖏᑦ ᑐᑭᓯᓇᖅᐳᖅ ᓈᓴᐃᔾᔪᑏᑦ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑐᑭᓕᐊᖅᑐᓂ ᖃᐅᔨᓴᕈᑕᐅᖕᒪᑕ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᓇᒦᓐᖔᖅᑐᑦ ᒪᓕᒡᓗᒋᑦ ᓴᖅᑭᑎᑦᑎᔾᔪᑕᐅᖕᒪᑕ. ᑖᒃᑯᐊ ᓈᓴᐃᓂᕐᒧᑦ ᑲᑎᖅᓱᐃᔾᔪᑕᐅᕙᒃᑐᑦ, ᐊᒡᒍᐃᔾᔪᑕᐅᓲᖑᕗᑦ ᓇᒦᓐᖔᕐᓂᖏᓐᓂᒃ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᑐᐊᕆᓐᖏᑕᖏᓐᓂᒃ. ᑖᒃᑯᐊ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᓇᓗᓇᐃᖅᓯᒪᕗᑦ ᐃᓕᐅᖅᑲᖅᓯᒪᔪᓂᒃ 2 ᐊᒻᒪ 3. ᑖᒃᑯᐊ ᕿᒥᕐᕈᓇᒍᑕᐅᕗᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔾᔪᑎᖃᕐᓂᑐᐊᖑᓐᖏᑦᑐᒥᒃ ᐃᓚᓕᐅᔾᔨᓯᒪᕗᑦᑕᐅᖅ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᐱᖓᓲᓕᖓᔪᓂᒃ ᐊᒡᒍᖅᑕᐅᔾᔪᑎᖏᓐᓂᒃ. ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᑦ ᓴᓂᒨᖓᓂᖏᑦ, ᑖᒃᑯᐊ ᐊᒡᒍᖅᓯᒪᓪᓗᑎᒃ ᐱᖓᓲᓕᖓᔪᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᓯᕗᓪᓕᐅᑎᑕᐅᑎᓪᓗᒋᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᓐᓇᖅᐳᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᑐᐃᓐᓇᕆᓐᖏᑕᖏᓐᓂᒃ ᓴᖅᑭᑎᑦᑎᔪᓐᓇᕐᓂᖏᓐᓂᒃ.

ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑕ ᑲᖐᓇᖅᐳᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᓂᕆᖃᑦᑕᕐᓂᖏᓐᓂᒃ, ᓇᒦᒻᒪᖔᑕᓗ ᓂᕐᔪᑎᐅᖃᑎᖏᓐᓂᒃ, ᐃᒪᕐᒥ ᐅᖁᒪᐃᓐᓂᖏᓐᓄᑦ ᐊᒻᒪ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᐅᑉ ᐃᖏᕐᕋᓂᖓᓄᑦ ᑕᕆᐅᕐᒥ ᐅᑭᐅᖅᑕᖅᑐᒥ. ᑖᒃᑯᐊ ᐊᔾᔨᒌᓐᖏᔾᔪᑎᒋᔭᖏᑦ, ᐱᓗᐊᖅᑐᒥᒃ ᓂᕆᖃᑦᑕᕐᓂᖏᓐᓄᑦ, ᑲᖐᓲᑕᐅᑐᐃᓐᓇᖅᐳᑦ ᒫᓐᓇ. ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑕ ᐊᖏᓂᖏᑦ ᒪᓕᒃᑐᒋᔭᐅᕗᑦ ᓇᒦᓐᓂᖏᓐᓂᒃ ᓂᕐᔪᑕᐅᖃᑎᖏᓐᓂ. ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᐊᓪᓚᓐᖑᐊᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐊᒻᒪ ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᖏᓛᖑᕗᑦ ᖃᐅᔨᓴᓚᐅᖅᑕᑦᑎᓐᓂ, ᐊᒻᒪ ᒥᑭᓛᖑᓪᓗᑎᒃ ᓇᐅᔮᓂ.
ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐅᓂᒃᑳᓕᐊᓂ ᑎ ᒫᔾᔨ ᐊᒻᒪ ᐊᓯᖏᓐᓄᑦ (ᐊᒥᓱᕈᖅᑎᑕᐅᔪᒃᓴᑦ) ᖃᐅᔨᓴᕈᑏᑦ ∑7-CB ᐊᒻᒪ ∑DDD ᐱᒻᒪᕿᐅᓛᖑᓚᐅᖅᐳᑦ ᕿᓚᓗᒐᖅᑕᐅᕙᒃᑐᓂᒃ ᖃᑯᖅᑕᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑭᒻᒥᕈᒥ ᐊᒻᒪ ᐃᖃᓗᖕᓂ ᐊᒡᒍᖅᓯᒪᓪᓗᑎᒃ ᐸᓐᓂᖅᑑᒥ ᐱᔭᐅᕙᒃᑐᓂᒃ. ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᑖᒃᑯᐊ ᐊᒡᒍᖅᓯᒪᔪᓂᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖏᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ ᐊᔾᔨᒌᓐᖏᓐᓂᖄᕐᔪᓚᐅᖅᐳᑦ ᑕᒪᓐᓇ ᐱᒻᒪᕆᐅᓪᓗᓂ ᓈᓴᐅᑎᖃᓚᐅᕐᒪᑕ 1-ᒥᒃ ᐊᒻᒪ 2-ᒥᒃ. ᑖᓐᓇ ᓈᓴᐅᓯᕆᔾᔪᑎ “r” ᐊᖏᓂᖏᓐᓂᒃ ∑7-CB ᐊᒻᒪ ∑DDD ᖃᐅᔨᒪᔾᔪᑕᐅᔪᖅ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᐳᖅ ᑎᑦᑕᖏᓐᓂᒃ 0.215 ᐊᒻᒪ 0.339 ᐊᑯᓐᓂᖓᓂ, ᑖᒃᑯᐊ ᐱᒻᒪᕿᐅᓪᓗᑎᒃ ᑎᑎᕈᑕᐅᔪᓄᑦ p < 0.03 (ᑎᑎᕐᓂᖏᑦ ᐊᖏᓂᖅᓴᑦ 0.03-ᒥᒃ). ᑕᐃᒫᑦᑕᐅᖅ ᖃᑯᖅᑕᓂᒃ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᓂᒃ ᖁᑦᑎᒃᑯᒥᐅᑦ ᒥᑭᓂᖅᓴᐅᓂᖃᓚᐅᕆᕗᑦ ᓈᓴᖅᑕᐅᓂᖏᓐᓂᒃ ∑PCB/∑DDD ᐊᐅᔭᒃᑯᑦ ᑲᑎᖃᑎᒌᒃᐸᒃᑐᓂᒃ ᑕᓯᐅᔭᕐᔪᐊᒥᐅᓂᒃ (ᐃᓕᐅᖅᑲᖅᑕᐅᓯᒪᔪᑦ 3 ᑕᑯᓂᐊᕐᓗᒋᑦ).

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ᑖᒃᑯᐊ ᓴᓂᓕᕇᓕᖅᑎᒋᐊᖏᑦ ᖃᑯᖅᑕᐃᑦ ᐊᒻᒪ ᐊᓪᓚᓐᖑᐊᑦ ᐱᔭᕆᐊᑭᑦᑑᓐᖏᓚᑦ ᓈᓴᖅᑕᐅᔾᔪᑎᖏᑦ ᐊᔾᔨᒌᓐᖏᒻᒪᑕ ᐊᒻᒪ ᖃᑯᖅᑕᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᐅᖅᓱᖏᓐᓂᒃ ᕿᒥᕐᕈᓇᓚᐅᓐᖏᒻᒪᑕ. ᑭᐊᓯᓂᓕ, ᐃᓱᒪᒋᓐᖑᐊᕐᓗᒍ ᐅᖅᓱᖃᕐᓂᖓ 80-90%-ᖑᑎᓪᓗᒍ ᖃᑯᑦᑕᓄᑦ, ᓴᓗᒻᒪᖅᓴᐅᑎᖃᕐᓂᖓ ᓇᐅᔮᓂ ᒥᑭᓛᖑᓚᐅᖅᐳᑦ ᐊᓪᓚᖑᓐᐊᓄᑦ ᐊᒻᒪ ᖃᑯᖅᑕᓄᑦ ᐸᓐᓂᖅᑑᑉ ᑲᖏᖅᑐᕐᔪᐊᖓᓂ. ᐊᖏᓛᖑᓚᐅᖅᐳᑦ ᐊᓪᓚᓐᖑᐊᓄᑦ ᕿᑭᖅᑕᕐᔪᐊᒥ ᐊᒻᒪ ᖃᑯᖅᑕᓄᑦ ᐃᖃᓗᖕᓂ.

ᑕᕝᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ ᖃᑯᖅᑕᓂᒃ (ᑎ ᒫᔾᔨ ᐊᓯᖏᑕᓗ ᐅᓂᒃᑳᓕᐊᖏᑦ) ᑖᒃᑯᐊ ᐃᓐᓴᐅᓂᖏᑦ ᐊᒻᒪ ᐊᕐᓴᐅᖕᒪᖔᑦ/ᐊᖑᑕᐅᖕᒪᖔᑦ ᐱᒻᒪᕿᐅᓚᐅᖅᐳᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ. ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐊᓪᓚᓐᖑᐊᓂᒃ, ᐊᕐᓇᐅᓂᖓ/ᐊᖑᑕᐅᓂᖓ ᐱᒻᒪᕆᐅᑎᑕᐅᕗᖅ ᑕᑭᓂᖓ ᐱᒻᒪᕆᐅᑎᑕᐅᓗᐊᕋᓂ. ᑕᒪᓐᓇ ᑕᑭᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑕᐅᔪᖅ ᓇᓗᓴᐃᒃᑯᑕᑦᑎᐊᕙᐅᓐᖏᒻᒪ ᐃᓐᓇᐅᓂᖓᓄᑦ. ᐊᒻᒪᑦᑕᐅᖅ, ᑖᒃᑯᐊ ᐊᓪᓚᓐᖑᐊᖅᑕᐅᓚᐅᖅᑐᑦ ᑕᑭᓂᖏᑦ ᐊᔾᔨᒌᒐᔪᓚᐅᕐᓂᖏᓐᓄᑦ. ᖃᑯᖅᑕᓂᒃ ᖃᐅᔨᓴᕐᓂᑎᑐᑦᑕᐅᖅ, ᐊᕐᓇᐅᓂᖏᑦ ᒥᑭᓂᖅᓴᐅᓚᐅᕆᕗᑦ ᓴᕈᖅᓯᒪᓂᖏᑦ ᐊᖑᑎᓂᒃ.

ᖃᐅᔨᓴᕈᑕᐅᔪᓕᒫᑦ ᓈᓴᐃᓂᕐᒥᒃ ᐊᑐᓚᐅᕐᒪᑕ, ᖃᐅᔨᔾᔪᑕᐅᓚᐅᖅᑐᑦ ᑖᒃᑯᐊ ᒪᕐᕉᓕᖓᔪᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᐊᔾᔨᒌᖕᓂᖃᓚᐅᕐᓂᖏᓐᓂᒃ. ᓈᓴᐃᓂᒃᑯᑦ ᑎᑎᕐᓂᓖᑦ p = 0.05-ᒥᒃ ᑐᑭᖃᖅᐳᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᓇᓕᖅᑲᐃᓂᑐᐃᓐᓇᕐᒧᑦ ᐊᔾᔨᒌᓐᖏᑐᐃᓐᓇᕆᐊᖃᕐᓂᖏᓐᓂᒃ 5%- ᖏᓐᓂ ᑖᒃᑯᐊ ᒪᕐᕉᓕᖓᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ ᑖᒃᑯᐊ ᐊᔾᔨᒌᓐᖏᑦᑐᑦ ᑖᒃᑯᓂᖓᑦᓴᐃᓐᓇᖅ ᐱᓯᒪᑐᐃᓐᓇᕆᐊᖃᕐᓗᑎᒃ. ᑖᒃᑯᐊ ᒪᕐᕉᓕᖓᑎᑕᐅᔪᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑕ ᐊᑯᓚᐃᓐᓂᖏᑦ ᓯᐊᕐᒪᒃᓯᒪᑦᑎᐊᖅᑎᓪᓗᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓪᓗ ᐊᒥᓲᑦᑎᐊᖅᑎᓪᓗᒋᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᓱᓕᔪᕐᓇᑦᑎᐊᕐᓂᖅᓴᐅᓲᖑᕗᑦ. ᑖᒃᑯᐊ ᒪᕐᕈᐃᓕᖓᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐊᔾᔨᒌᓐᖏᓐᓂᖏᑦ ᓴᓂᓕᕇᓕᖅᑎᓪᓗᒋᑦ ᐊᓯᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓄᑦ, ᐱᓯᒪᒃᐸᑕ ᐊᒥᓲᓂᖅᓴᓂᒃ, ᐊᔾᔨᒌᓐᖏᓐᓂᖏᓐᓂᒃ ᓇᓗᓇᐃᖅᓯᑦᑎᐊᓲᖑᕗᑦ ᓇᓕᖅᑯᑦᑕᑐᐃᓐᓇᓐᖏᓐᓂᖏᓐᓂᒃ. ᓲᕐᓗ, ᐃᓚᒌᓗᐊᖅᑐᑦ ᖃᐅᔨᓴᖅᑎᓄᑦ ᐱᔭᐅᓐᖏᑦᑐᕕᓂᐅᑐᐃᓐᓇᕆᐊᖃᖅᐳᑦ ᑕᐃᒫᒃ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᒫᕐᕉᓕᖓᑎᑕᐅᔪᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ ᐊᔾᔨᒌᐸᓘᔪᓐᓇᖅᐳᑦ ᐱᓯᒪᓂᖏᑦ ᐊᔾᔨᒌᓐᖏᒃᑲᓗᐊᖅᑎᓪᓗᒋᑦ. ᖃᐅᔨᓇᓱᓗᐊᖅᐸᕗᑦ ᑕᕝᕙ ᐊᔾᔨᒌᖕᓂᖏᑦ, ᐊᔾᔨᒌᓐᖏᑦᑐᓂᒃ ᐱᓯᒪᓂᖏᑦ ᑭᖑᓪᓕᐅᑎᑦᑐᑎᒍᑦ.

ᑐᑭᓯᑦᑎᐊᓐᖏᔾᔪᑕᐅᔪᓐᓇᕐᒥᔪᖅᑕᐅᖅ ᖃᐅᔨᓴᖅᑕᐅᕕᐅᔪᑦ ᖃᑦᓰᓐᓇᐅᓗᐊᖅᑎᓪᓗᒋᑦ ᑕᐃᒪᐃᑎᓪᓗᒍ ᓇᓕᖅᑯᑦᑕᑐᐃᓐᓴᕐᓂᖏᑦ ᖃᐅᔨᔭᒃᓴᐅᑦᑎᐊᓐᖏᒻᒪᑕ.

ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᖃᐅᔨᓴᖅᑕᓕᒫᕗᑦ ᐊᔾᔨᒌᖕᓂᖃᖅᑐᐃᓇᐅᕗᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᖃᐅᔨᓪᓚᑖᕈᓐᓇᓐᖏᓚᒍᑦ ᑖᒃᑯᐊ ᐱᑕᖃᕐᓂᖏᑦ ᐊᔾᔨᒌᑐᐃᓐᓇᕐᒪᖔᑕ, ᐅᕝᕙᓗ ᑲᑎᓐᖓᖃᑎᒌᓐᖏᑦᑐᑦ ᑲᑎᑲᐃᓐᓇᖃᑦᑕᕐᒪᖔᑕ. ᑕᒪᓐᓇ ᑭᓯᐊᓂ ᖃᐅᔨᑦᑎᐊᕋᒃᓴᐅᕗᖅ ᕿᒥᕐᕈᓇᑦᑎᐊᖅᓯᒪᓗᒋᑦ ᐊᒡᒍᖅᓯᒪᓂᓕᒫᖏᑦ.

ᓈᓴᐃᓂᑦᑎᓐᓂ ᓴᖅᑭᑎᑦᑎᑦᑕᐃᓕᓯᒪᒐᓗᐊᖅᑐᒍᑦ ᓱᓕᓐᖏᓕᖅᑎᑦᑎᔪᓐᓇᖅᑐᓂᒃ, ᑭᓯᐊᓂ ᐅᔾᔨᖅᓱᐃᓐᓇᕆᐊᖃᖅᐳᒍᑦ ᓴᖅᑭᑦᑐᓐᓇᕐᓂᖏᓐᓂᒃ ᐱᔮᖅᑯᑕᐅᓐᖏᓪᓗᑎᒃ. ᑖᒃᑯᐊ ᖃᐅᔨᓴᕈᑎᒋᓯᒪᔭᕗᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᑦ ᒪᓕᒡᓗᒋᑦ ᓇᓂᓯᓯᒪᕗᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᑦ ᒪᓕᒡᓗᒋᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᑕᓪᓕᒪᐃᓐᓇᕐᓂᒃ ᐱᓯᒪᔪᓂᒃ ᐱᓕᕆᓐᓂᕈᑦᑕ ᑖᒃᑯᓕᒫᖅ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᓂᒃ ᐱᑕᖃᖅᑐᐃᓐᓇᐅᒃᐸᑕ ᓇᓕᖅᑯᑦᑕᑐᐃᓐᓇᖅᓯᒪᔪᓂᒃ, ᐃᓚᖏᑦ ᐱᑕᖃᕐᓂᖅᓵᓘᔮᖅᑎᑕᐅᔪᓐᓇᖅᐳᑦ. ᑕᐃᒪᐃᓕᖅᑎᑦᑎᔪᓐᓇᖅᐳᑦ ᓈᓴᐃᓂᕐᒥ ᐊᒥᓲᑎᑦᑎᓗᑕ ᐊᑐᕐᓂᕈᑦᑕ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᓈᓴᐃᔾᔪᑎᒋᔭᕗᑦ ᖃᑦᓰᓐᓇᐅᑎᓐᓇᓱᒃᓯᒪᕙᕗᑦ ᐊᑐᕋᓱᒡᓗᑕᓗ ᐊᒥᓲᔪᓂᒃ ᐱᕕᒋᔪᓐᓇᖅᑕᑦᑎᓐᓂᒃ. ᐅᕙᓂ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᐸᓐᓂᖅᑑᒥ ᐊᒻᒪ ᑲᖏᖅᑐᒑᐱᖕᒥ ᐱᖃᑕᐅᑎᑦᑎᓚᐅᓐᖏᓚᒍᑦ ᖃᑦᓰᓐᓇᐅᓗᐊᖅᑐᓂᒃ ᖃᐅᔨᓴᕋᒃᓴᖅᑖᓚᐅᕐᓂᑦᑎᓐᓂᒃ. ᐱᖃᓯᐅᑎᑕᐅᑎᓪᓗᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᕐᒥ ᖃᐅᔨᓴᖅᑕᐅᔾᔪᑎᓂᒃ ᖃᑦᓰᓐᓇᕈᕆᐊᖅᑎᑦᑎᓂᕐᒧᑦ ᐃᓕᔭᐅᓂᖏᑦ ᐱᑦᑎᐊᖅᓯᒪᖅᑰᔨᕗᑦ ᖃᐅᔨᒪᓂᕗᑦ ᑖᒃᑯᓂᖓ ᒪᓕᒡᓗᒋᑦ.

ᐅᖃᖅᑐᖃᖃᑦᑕᖅᓯᒪᒐᓗᐊᖅᐳᖅ ᖃᐅᔨᓴᕐᓂᕈᑦᑕᒎᖅ ᓇᑭᓐᖔᖅᓯᒪᓂᖏᓐᓂᒃ ᐃᓱᒪᓐᖏᓪᓗᑕ ᓯᕗᓂᐊᓂ ᖃᐅᔨᕚᓪᓕᕈᑎᒋᓇᔭᖅᑕᕗᒡᒎᖅ ᐊᒡᒍᖅᓯᒪᔾᔪᑎᖏᓐᓂᒃ. ᑭᓯᐊᓂᓕ, ᑕᐃᒪᐃᓐᓂᐊᕐᓂᕈᑦᑕ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᖃᕐᓂᖏᓐᓂᒃ ᓂᖁᐊᕆᐊᖃᕋᔭᖅᐳᒍᑦ ᓱᓕ. ᐅᖃᖅᑲᐅᒐᑦᑕ ᓯᕗᓂᐊᓂ, ᐊᒥᓱᓂᒃ ᓂᕈᐊᕈᓐᓇᕐᕕᖃᓚᐅᖅᐳᒍᑦ, ᐊᒻᒪ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᐊᑲᐅᓐᖏᓕᐅᕈᑎᖃᑐᐃᓐᓇᕆᐊᓕᒃ ᓈᓴᐃᓂᑦᑎᓐᓄᑦ. ᐊᒻᒪᑦᑕᐅᖅ ᐊᑲᐅᓐᖏᓕᐅᕈᑕᐅᔪᓐᓇᕐᒥᔪᖅ ᓈᓴᐃᓂᕐᒥ ᐃᓱᒪᒋᔭᐅᓗᐊᓲᖑᓐᖏᒻᒪᑕ ᓈᓴᐃᔾᔪᑏᑦ ᐆᒪᔪᓄᑦ ᑲᑎᖃᑎᒌᑲᐃᓐᓇᓲᖑᔪᓄᑦ ᓈᓴᖅᑕᐅᓂᖏᑦ ᐊᔾᔨᒌᓕᖅᑕᕐᓂᖃᖅᑎᓪᓗᒋᑦ. ᓇᓗᓇᓐᖏᓚᖅ ᓯᕗᓂᑦᑎᓐᓂ ᑖᒃᑯᐊ ᓈᓴᐃᔾᔪᑏᑦ ᐃᓱᒪᒋᔭᐅᑦᑎᐊᕐᓂᖅᓴᐅᔪᓐᓇᕐᓂᐊᖅᑐᑦ ᐊᒡᒍᖅᓯᒪᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ.

ᑖᒃᑯᐊ ᖃᐅᔨᓴᕈᑕᐅᓯᒪᔪᑦ ᐃᓗᓕᖏᓐᓂᒃ ᑐᒃᓯᕋᕐᕕᒃᓴᐅᕗᖅ ᖃᐅᔨᓴᖅᑎᒥᑦ.